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THE MEDICAL JOURNAL OF AUSTRALIA



Vol. I.—14TH YEAR.

SYDNEY: SATURDAY, JANUARY 1, 1927.

No. 1.

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INTERIM REPORT ON MATERNAL MORTALITY AND MORBIDITY IN VICTORIA.¹

By R. MARSHALL ALLAN, M.C., M.D., F.R.C.S.E.,
Director of Obstetrical Research,
University of Melbourne.

THE high incidence of puerperal mortality in English-speaking countries has in recent years led to the institution of accurate investigations concerning its extent and causation. A brief summary of these activities will not be out of place.

Great Britain.

Two important reports were furnished in 1924 by Dame Janet Campbell and the Scottish Board of Health to the Ministry of Health. The following year a committee was appointed by the British Medical Association to investigate the subject in a thorough manner. An interim report has been published and a *questionnaire* circulated throughout the country.

¹ Read at a meeting of the Victorian Branch of the British Medical Association on November 17, 1926.

Canada.

At a conference on the medical services in Canada held in 1924 the whole subject of maternal mortality was thoroughly debated. The cooperation of the medical profession was sought in an analysis of the deaths from puerperal diseases. The response throughout the Dominion was splendid and a report based on 10,000 returns is promised for 1927.

United States of America.

In 1921 the American Association of Obstetricians, Gynecologists and Abdominal Surgeons appointed a committee to investigate the high mortality of the United States. Extensive propaganda, including lectures, publication of suitable literature and the issue of *questionnaires* to the profession, has been carried out. In the same year the "Sheppard Towner" Act was passed. This provides for an annual federal subsidy as well as a *pro rata* grant according to population to be paid to individual States. The latter, if agreeable to the scheme, must spend in addition an amount equal to the federal subsidy. The money is to be used "for instruction in the hygiene of maternity and infancy through

public health nurses, consultation centres and other suitable methods."

New Zealand.

The Health Department entered upon an intensive campaign in 1924 for the promotion of maternal welfare and the reduction of the heavy mortality of infants under one month. Dr. Henry Jellett was appointed consulting obstetrician with instructions to revise the methods of training midwives and also to suggest improvements in the domestic practice of obstetrics. In addition an inspector of private hospitals, a medical officer in charge of antenatal clinics and nurse inspectors of private hospitals were appointed.

Australia.

The report of the Royal Commission on Health issued in 1926 made the following recommendations regarding maternity hygiene:

- (1) The establishment of a division of maternity hygiene in the Federal Department of Health.
- (2) Conditional subsidies to States to provide facilities for attention to women before, during and after child-birth.
- (3) Amendment of the *Maternity Allowance Act*: (a) To provide that application for the allowance should be made at least five months before child-birth. No payment to be made unless a medical certificate be produced showing that the mother has had antenatal supervision. (b) No child to be deemed viable which measures less than thirty-five centimetres (approximately fourteen inches) in length.
- (4) Conditional subsidies to assist in the education of medical students and nurses in obstetrics.
- (5) The encouragement and development of research.

New South Wales.

A Director of Maternal and Child Welfare was appointed during the present year.

Queensland.

The Queensland Branch of the British Medical Association has appointed a committee to inquire into the maternal mortality of the State.

Victoria.

The highest praise is due to the efforts of the medical profession to raise the standards of obstetric practice in the State.

When the Melbourne Permanent Post-Graduate Committee was formed in 1920 obstetrics was given a prominent place in its activities. Post-graduate classes and lectures were arranged, not only in the metropolis, but also in country centres. The Women's Hospital was the first maternity hospital in Australia to hold an annual residential post-graduate course.

In 1924 the Victorian Branch of the British Medical Association appointed an obstetric inquiry committee which published an important report following on a *questionnaire* issued to all members. As a result of this report an anonymous medical donor offered a prize throughout Australia for an essay on the causation and prevention of maternal mortality and morbidity. The successful essayist was Dr. E. S. Morris, now Director of Maternal and Infant Welfare in New South Wales. Following on

this the Edward Wilson (*Argus*) Trust donated £10,000 to the University for the appointment of a director of obstetrical research for two years. His duties were to inquire into the causes of maternal mortality and morbidity in Victoria and suggest means to prevent or lessen the same.

Recently Dr. Vera Scantlebury and Dr. Henrietta Main presented a report on the welfare of women and children in Victoria and New Zealand. In the report the authors stressed the importance of antenatal supervision and the need for mothercraft instruction of nurses. Since the publication of the report Dr. Scantlebury has been appointed Director of Infant Welfare. During the past month the Government appointed a State medical research advisory council composed of experts associated with various branches of research. The Director of Obstetrical Research was appointed a member of the Council. The object of the work is to coordinate all research activities and act in an advisory capacity to the Government in these matters. A strong movement is proceeding to establish a new University clinical hospital and a medical school which will embrace all research work under one roof.

The medical profession, fully alive to the importance of the subject is, therefore, in the forefront of the endeavours being made to meet the situation.

The work, initiated by the foresight and wisdom of the Edward Wilson (*Argus*) Trust, has been directed along three main lines:

- (i.) A statistical investigation.
- (ii.) An exhaustive survey of domestic obstetric practice involving personal interviews with medical practitioners and the inspection of all hospitals registered to admit obstetric cases. Included in this would be the collection of statistics from hospital and private practice.
- (iii.) Clinical research conducted by members of the staff of the Women's Hospital in collaboration with the biochemical department of the University of Melbourne and the bacteriological department of the Walter and Eliza Hall Institute for Research in Pathology and Medicine.

In this report the work so far carried out will be presented under these three main headings.

STATISTICAL INVESTIGATION.

For the purposes of this report the statistics dealing with Victorian results have been compiled from the State returns. The Commonwealth figures have been used for any interstate or international comparisons.

Statisticians place varying interpretations on certificates, particularly on those showing more than one cause of death. In practice this means that a case may be classed puerperal by one office and non-puerperal by another and leads to wide variations in the number of cases classified as due to puerperal causes according to the Commonwealth and Victorian statisticians. For example, in 1924 the Commonwealth credited 87 deaths from puerperal sepsis to Victoria and 46 in 1925, whilst the State figures for the corresponding periods were 56 and 39

respectively. Both offices are endeavouring to obtain a common basis for classification and during this year unanimity has almost been attained.

Some countries include still-births and miscarriages and calculate the rate from the total births, living and dead. This renders comparison with Victoria rather difficult.

The Present Incidence of Maternal Mortality in Victoria.

During 1925 there were 35,922 births and 156 deaths from puerperal causes. The maternal mortality rate per 1,000 live births was 4.34 and corresponded to a rate of 18 per 100,000 of the total female population of the State. Looked at from another angle every 228 confinements accounted for the death of one mother. These figures are rather better than the average for the whole Commonwealth where one maternal death resulted from every 175 confinements.

While this economic loss is serious enough in itself, no exact estimate can be made of the effect on the children suddenly bereft of that maternal care so essential to their proper development. Although the majority of mothers died early in married life, 149 married women left behind 345 children. In addition there were seven deaths among single women.

Maternal Mortality and the General Death Rate.

The report of Dame Janet Campbell issued by the British Ministry of Health contained a statement which has been frequently quoted, namely that, while the general death rate has been reduced by one-third and the infant mortality rate halved since the beginning of the century, the maternal mortality rate is but little lower than it was twenty years ago. These deductions have, however, been challenged by the committee of the British Medical Association.

As regards Victoria the relative position is as follows:

TABLE I.

Death Rates.	1905.	1925.
General	12.17	9.47
Of Infants	83.30	57.00
Puerperal—		
(a) Sepsis	1.76	1.08
(b) Other causes	3.95	3.26
(c) All causes	5.71	4.34

This represents a decrease of 22% in the general death rate and 31.5% in infantile mortality as compared with one of 23% for all puerperal causes. Of the latter sepsis decreased by 38%, while the rate for other causes has only diminished by 17%.

Incidence of Mortality Within the State.

A careful survey of the statistics for the period 1914 to 1925 leads to the following conclusions:

1. Melbourne and suburbs show the highest rate for sepsis and except in 1914-1917, the lowest rate for other causes of puerperal mortality in the State.

The total mortality over the whole period under review is equal to that of the industrial area of the State and both exceed the rates for other divisions of the State.

2. The principal country towns, though possessing the lowest septic rate, are handicapped by the highest rate for other causes. The total figure is slightly higher than that of the rural areas.

3. The rate for rural areas is the lowest in the State. While the septic rate has remained practically stationary over all periods, that from other causes has shown a tendency to increase progressively.

Causes of Maternal Mortality.

Puerperal sepsis is responsible for slightly more than one-third of the total deaths. It is a debatable point whether the majority of cases of puerperal phlegmasia should not be included with those of sepsis. While puerperal albuminuria, accidents of pregnancy and other accidents of labour individually do not cause the loss of so many lives as sepsis, collectively they form an important factor in maternal mortality. The majority of these fatalities can be eliminated by thorough antenatal supervision and until this is recognized particularly by the general public, no considerable reduction in the maternal death rate will occur.

Notification of Puerperal Sepsis.

The utter failure of notification in Victoria, either as an index of the prevalence of sepsis or as a means of insuring early treatment and prevention of spread of infection, is well illustrated in the following table:

TABLE II.—NOTIFICATION OF PUERPERAL FEVER, VICTORIA.

Year.	Number of Notifications.	Number of Deaths.
1921	48	58
1922	61	31
1923	41	29
1924	57	56
1925	30	39
Whole period ..	237	213

It is obvious that practically only hopeless cases have been notified and a comparison with the corresponding figures for New Zealand is illuminating:

TABLE III.—NOTIFICATION OF PUERPERAL SEPSIS, NEW ZEALAND.

Year.	Number of Notifications.	Number of Deaths.
1921	178	48
1922	262	52
1923	176	52
1924	308	52
1925	336	42
Whole period ..	1,260	246

The Director-General of Health, New Zealand, states that the increase in the number of notifications is not due to an increase in incidence of puerperal fever, but to much freer notification. The number of deaths has been greatly reduced, the average for the preceding ten years having been fifty-three.

Many of the difficulties associated with notification have been met by the recent regulations of the British Ministry of Health. The name has been altered to "puerperal pyrexia." Medical practitioners must report any febrile condition which occurs in a woman within twenty-one days after child-birth or miscarriage in which a temperature of 38° C. (100.4° F.) or more has been sustained during a period of twenty-four hours or has recurred during that period. Help is forthcoming, if requested by the doctor, provided that he furnishes a form which requires very detailed information regarding the case.

The Onus of Responsibility.

In the past much time has been wasted in attempts to apportion between the doctor and the nurse the blame for the excessive mortality in child-birth. The maternity allowance returns show that as far as Victoria is concerned the percentage of women attended by a doctor has steadily risen.

TABLE IV.—MEDICAL ATTENTION OBTAINED AT CONFINEMENTS.

Year.	Metropolitan Area.	Rest of State.	Total State.
1911	73%	65%	68%
1918	81%	77%	79%
1924	87%	90%	89%

The year 1911 has been chosen to represent the proportion of women attended by a doctor immediately prior to the commencement of the *Maternity Allowance Act* in 1912. The latest figures for the year ending June, 1926, show that 91% of all women in child-birth have had medical attention. No statistics are available to enable a comparison to be made between women attended by doctors and nurses separately.

An inspection of the death certificates for 1923-1925 shows that there has been no undue incidence of sepsis in the practice of any one practitioner. The cases are distributed among many doctors spread over a wide area in the State.

International Comparison of Mortality Rates.

An international comparison of mortality rates is difficult because of variation in the methods employed in the compilation of statistics. The efficiency of registration of births and deaths also varies. The Australian standards in this respect have been maintained at a high level for many years.

Reliance on statistics alone tends to give an erroneous conception of the true incidence of puerperal mortality in the individual Australian States because of the relatively small number of deaths. On the other hand the slightest lowering of the

standards necessary for safe delivery of mother and child is penalized more heavily in the statistical results of Australia than in those of other more densely populated countries.

International comparisons have, however, little practical bearing on the problems facing Victoria. The State cannot afford the economic and domestic loss caused by the annual deaths of one hundred and fifty mothers from causes associated with child-birth. Our attitude must be one of profound dissatisfaction and a desire that by cooperation of the general public and the medical profession this loss will be prevented as far as possible, irrespective of the standards deemed satisfactory by other countries.

The Association of Maternal and Infant Mortality.

All attempts to effect a material reduction in the infant mortality under one year have been largely frustrated by the persistent refusal of the age group under one month to react to the measures found successful at later periods.

TABLE V.—INFANT MORTALITY, VICTORIA.

Period.	Number of Deaths per Thousand Births.		
	Under One Month.	Over One and Under Twelve Months.	Under One Year.
1881-1890	37.2	89.4	126.6
1891-1900	33.8	77.9	111.7
1900-1904	34.3	63.7	98.0
1905-1909	32.8	48.0	80.8
1910-1914	32.6	41.2	73.8
1915-1919	33.4	32.7	66.1
1920-1924	33.0	32.3	65.3
1925	30.9	26.1	57.0

It will be noted that the mortality under one month has remained practically stationary over a considerable period. Since 1915-1919 the rate between one and twelve months has become less than that of the group under one month.

Infant Mortality Under One Month.

An inspection of Table VI. shows clearly that the greatest number of deaths occur in the first week. While this rate has undergone a definite increase in the last period under review, that for ages between one and four weeks has appreciably diminished. The relationship between these figures and the maternal mortality rates is also shown.

Infant Mortality Under One Week.

During 1925 the number of infants who died under one year, was 2,046. Of these 1,110 or 54% died within one month of birth. Three-quarters of these deaths or 831 were within the first week of life.

The causes of death for all infants under one week were as follows:

Premature birth	411
Injury at birth	107
Diseases peculiar to early infancy	96
Congenital debility	95
Congenital malformations	76
Convulsions	16
Pneumonia, broncho-pneumonia	7
Other causes	23
All causes	831

TABLE VI.—INFANT MORTALITY, VICTORIA, PER 1,000 BIRTHS. RATES FOR VARIOUS AGE GROUPS—COMPARISON WITH MATERNAL MORTALITY RATE.

Period.	Deaths of Infants per Thousand Births.					Maternal Mortality Rate.
	Under One Week.	Over One and Under Four Weeks.	Total Under One Month.	Over One and Under Twelve Months.	Total Under One Year.	
1910-1914 ..	21.5	11.1	32.6	41.2	73.8	4.54
1915-1919 ..	23.3	10.1	33.4	32.7	66.1	3.84
1920-1924 ..	23.7	9.3	33.0	32.3	65.3	4.23
1925	23.1	7.8	30.9	26.1	57.0	4.34

If pneumonia and other causes be excluded, the remainder of 96% of the total were directly related to abnormalities of pregnancy or labour.

ADMINISTRATIVE CONTROL OF HEALTH IN VICTORIA.

There is no central authority controlling the health affairs of the State. Two government departments are concerned, those of the Minister of Health and the Treasurer.

As far as obstetrics is concerned the Minister of Health through the Health Department, administers the *Health Act*, the *Midwives Act* and the *Nurses Registration Act*. The Treasurer, by means of the Charities Board, controls the plans as to lay-out, equipment and general service of all public hospitals, nursing societies and refuges.

The Commission of Public Health comprising the Chief Health Officer as chairman and six representatives of the medical profession and municipal councils, administers the *Health Act*. The resolutions of this commission are carried out as far as possible by the Health Department. The commission has no control over the officers of the Health Department and cannot spend any money.

The *Midwives Act* and the *Nurses Registration Act* do not come under the commission, but are administered by the Health Department itself.

Inspection and registration of private hospitals are controlled by the commission and not by the local municipal councils through their medical officers of health.

Registration and Control of Hospitals and Nursing Associations.

Public Hospitals.

The Charities Board (under the Treasurer) is concerned with the proper distribution of public hospitals within the State. The Secretary of the Board who is also Inspector of Charities, deals with details of maintenance, equipment and general service. In effect he determines whether the proposed hospital is a good working unit for convenience of patients, medical officers and nurses.

Private Hospitals.

Private hospitals also include those hospitals functioning as intermediate, there being so far no legal recognition of intermediate hospitals. They are controlled by the Minister of Health through the Health Department.

If any private hospital desires to be registered as an obstetric training school, it is then supervised

by the Midwives' Board as regards compliance with the training regulations. This Board is a separate body from the Commission of Public Health, but is responsible to the Minister of Health.

Bush Nursing Association.

The Bush Nursing Association is a private organization and is under no government control except in so far that the Health Department must approve of all plans for bush nursing hospitals.

It will be readily seen that this unsatisfactory division of authority between two government departments (Health and Treasury) does not conduce to efficiency. There are too many loopholes available for evasion of responsibility or the shelving of important matters.

Registration of Obstetric Nurses.

In other States there is one nurses' registration board for all branches of nursing. In Victoria the Nurses' Registration Board does not control obstetric nurses since these are registered by a separate Midwives' Board. This board is composed of five public service members, none of whom are in touch with current obstetric problems. Their duty is to interpret the *Midwives Act*, to appoint a board of examiners and to deal with any disciplinary matters. The Board of Examiners consists of three doctors and one nurse, all of whom are in active practice. In addition to examining candidates they may forward any recommendations which they deem advisable for the consideration of the Midwives' Board.

By the courtesy of the Chairman of the Board of Examiners I have been present at one of the examinations. It was conducted in a fair and impartial manner and every consideration was shown to the candidates. At present there are only written and oral tests. A practical examination conducted at the bedside is needed to insure that the candidates have a more than theoretical knowledge of their work as is already done in Great Britain.

Number of Nurses on the Register of Midwives.

When the *Midwives Act* became law in 1915, all women practising obstetrics were required to register.

Three classes were formed: (i.) Those nurses holding a certificate from the Women's Hospital or such other equivalent from other States as approved by the Board. Registration under this section was permitted until the end of 1916; (ii.) all women

who could produce evidence of having been in *bona fide* practice for two years prior to the Act. This class was termed "practice midwives" in contradistinction to the "trained midwives." No further registrations under this clause were permitted after 1917 except in the case of nurses returning from active service; (iii.) after 1916 it was compulsory for all applicants to pass an examination after the prescribed course (six months for a nurse with previous general training, twelve months for other trainees).

Provision is also made for registering nurses from other dominions in which reciprocal treatment is given to Victorian nurses.

Since the Act came into force 3,741 midwives have been registered and 1,095 deregistered, mainly on account of death, old age, marriage and cessation from nursing. One or two have been deregistered for misconduct.

At present there are 2,646 midwives registered; exactly half are practice nurses and the remainder trained. Many of the latter have taken the obstetric certificate only in order to qualify them for higher nursing positions as matrons of hospitals.

The Training of Nurses.

Victoria is the only State which allows private hospitals to be registered as training schools. Acting on the advice of the Board of Examiners the Midwives' Board has refused to register any more. I agree with the examining board that the results of such registration have not justified this recognition.

Metropolitan Training Schools.

Those metropolitan training schools dealing with the public hospital class of patients are the Women's Hospital, Queen Victoria Hospital, Salvation Army Maternity Home, Fitzroy, and the District Nurses' Association. The remainder, twenty-two in number, are either private hospitals or those usually termed intermediate, namely St. George's and Bethesda.

Lectures are given at the Women's Hospital by the members of the honorary medical staff for all trainees in the metropolitan area except those of the Queen Victoria and St. George's Hospitals who have their own lecturers.

The main defects of the majority of the registered private hospital training schools are firstly that at least six of the hospitals do not average more than seventy to eighty patients *per annum*. In one case the matron is a practice and not a trained nurse. Secondly the number of women a trainee actually delivers is very small in many private hospitals; thirdly, thorough instruction by the matron is frequently wanting. No apparent attempt is made to insure a reasonable standard before the nurse sits for her examination. In the fourth place lack of knowledge of the elements of mothercraft training is quite evident.

Country Training Centres.

The McKellar Hospital, Hamilton, and the Ballarat Hospital can be considered capable of pro-

viding an adequate course. The other hospitals at Colac, Castlemaine and Horsham suffer from the same defects as have already been noted, though not to the same extent. Whenever maternity units are established at the proposed base hospitals under the scheme of the Charities Board, they should prove of equal value to the centre at Ballarat.

Obstetric Hospitals in General.

As 60% of all confinements occur in either public or private hospitals in Victoria the standards attained by both classes of hospitals is of the greatest importance.

Public Hospitals in Melbourne and Suburbs.

The Women's Hospital.—The obstetrical department at the Women's Hospital contains 132 beds and last year the number of deliveries in the interne department was 2,680, a greater number than any other Australian maternity hospital. Attached to the hospital is a large antenatal department which is continually growing. Patients requiring treatment are admitted to the prematernity wards. This is the only teaching hospital for students and the main centre for training of nurses.

The value of the hospital, not only to the patients and the students, but also to the advancement of obstetric science in Victoria has been greatly increased during the year by the addition of an obstetric theatre where students and post-graduates can be given clinical lectures without disturbing or intruding into the labour ward. In addition all necessary obstetric major operations are performed here under the most favourable circumstances. In the next place there is the appointment of an assistant pathologist to cope with the increasing demands for laboratory investigation of various diseases and complications of obstetrics and gynaecology. In the third place there is the holding of staff conferences each month by members of the honorary obstetric staff, the Superintendent and the senior Resident Medical Officer. The records of the previous month are gone into very carefully and the reasons for failure of treatment or for any deaths discussed in detail. The fourth advantage is the formation of an after care department. Patients are requested to return at definite intervals for examination and correction of any troubles arising from parturition.

Queen Victoria Hospital.—The Queen Victoria Hospital is staffed by women doctors and admits only women and children.

The obstetrical block contains nineteen beds and is very cramped for space. A new maternity wing to accommodate ninety patients is in process of building and will afford better scope for the work of the honorary staff.

There is no instruction of students at present, but nurses receive an excellent obstetric course both here and in the externe department in association with the District Nurses' Society.

All patients must attend the antenatal department, hence the value of antenatal supervision is seen in the records of the hospital. A government venereal disease department is attached to the hos-

pital and in addition to the usual out-patient accommodation has thirteen beds for patients requiring indoor treatment. All the patients in the antenatal department have a blood test performed and if necessary are transferred to the clinic for treatment.

Alfred Hospital.—At present there is no maternity indoor accommodation at the Alfred Hospital. An antenatal clinic is held and it is only a question of time before a complete obstetric unit is formed at this important hospital.

Private Hospitals in Melbourne and Suburbs.

Too many alleged private hospitals are merely nursing homes which have come into existence because of the *Maternity Allowance Act*.

Although in the main the health regulations as regards building, sanitation and sufficiency of light and air are complied with, the following defects were noted in many hospitals.

They are poorly furnished and lack proper means of sterilizing dressings and the like.

Patients with surgical and medical conditions are indiscriminately mixed with obstetric patients. The precautions taken to avoid infection are not adequate.

Very few hospitals have an isolation room or block for suspicious cases.

Many are understaffed and no provision is made for the permanent employment of a nurse on night duty.

Few hospitals have a good nursery. The children either sleep with their mothers at night or are kept in the staff dining-room or kitchen. Artificial feeding is too frequently resorted to in order to save trouble and keep the infants quiet.

Records are not well kept in many hospitals. Patients with septic infections are transferred to other hospitals when a fatal ending seems probable.

Some untrained nurses are unable to take and record a temperature. Charts are often not used and in a few cases charts are entered up without the actual temperature of the patient having been taken. In justice to the majority of hospitals and nurses I must add that this complaint applies to a few low grade hospitals.

The worst hospitals have been kept by nurses who attend patients in their own homes as well in hospitals. Patients are left in the hospital for long periods without any skilled attention. The chances of spreading infection are greatly increased by this method of practice.

In industrial areas many untrained and unregistered women take patients into their houses under the guise of lodgers or under the plea of emergency. The difficulty of securing a conviction has prevented the Midwives' Board from dealing firmly with this prevalent evil in certain suburbs.

The registration and inspection of private hospitals has been taken away from the local authorities by the Health Commission. Owing to lack of inspectors the control exercised by the central authority is not very efficient.

The contrast between the intermediate hospitals, St. George's and Bethesda, and the average nursing home points to the need of modern maternity units in every suburb or group of suburbs.

Country Obstetric Hospitals.

Criticism of the country obstetric hospitals is limited to an area west and north-west of Melbourne roughly bounded by Camperdown, Ballarat and Bendigo.

Practitioners in many rural areas are to be congratulated on their success in making the best out of the poor materials at their disposal and on maintaining in the majority of instances a high standard of efficiency under discouraging circumstances.

I desire to express my appreciation of the cooperation and goodwill existing between the district health officers and the medical practitioners in their respective areas. By exercising common sense in the interpretation of the regulations they have largely bridged the gulf between the public health official and his colleague in general practice.

Refuges as Obstetric Hospitals.

While accommodation has been provided in various parts of the State for unmarried prospective mothers the daily average of occupied beds has varied considerably. Institutions which are conducted by religious organizations, invariably show a larger number of occupants than those under undenominational control. The majority do not act as obstetric hospitals, but care for the girls before and after confinement.

Arising out of the problem of the single mother is that of the exploitation of these girls by some private hospitals in Melbourne. The following advertisements have been taken from current copies of the daily press.

Nurse, private home, girl indisposed, assist house work, wages——.

Nurse offers country girl indisposed good home and wages——.

Cheap domestic help is thus obtained and when labour supervenes the girl is sent in many instances to the Women's Hospital and all further liability or interest ceases.

Nursing Associations and Welfare Societies.

Melbourne District Nursing Association.

The district nurses are doing valuable work in the industrial suburbs. They work in conjunction with the local doctors or, if no doctor be engaged, with students from the Women's Hospital or trainees from the Queen Victoria Hospital. All complications are immediately reported to the Women's Hospital or the patients are seen by a local doctor. During 1925 there were five hundred and twenty confinements without a death. Medical practitioners who have worked with them, are well satisfied with their assistance. Recently an after care home was opened to accommodate semi-convalescent patients discharged from the public hospitals and also invalids requiring more attention than they can receive at home. Owing to the pressure on the available number of beds at the Women's

Hospital, patients have to be discharged sooner than the committee desires. To these mothers this extra rest makes all the difference not only to their own health, but to the prospects of successfully feeding their infants.

Infant Welfare Centres.

While the greatest scope for the infant welfare centres lies in endeavours to save infant life, there are also many opportunities for giving antenatal advice. The value of these centres is undoubted in any scheme for antenatal supervision if this be made compulsory before the payment of the maternity bonus. Under the guidance of the Director of Infant Welfare these centres will prove of great value in teaching students and trainees the essentials of mothercraft.

Bush Nursing Association.

The working of the Bush Nursing Association has a very definite bearing on maternal mortality in the country districts. All the nurses possess a general and an obstetric certificate and in addition many hold the mothercraft diploma. Three stages exist in the organization. First there is the centre where the nurse boards with a family in her district and attends to cases wherever wanted. In addition medical inspection of school children and instruction in hygiene are given. The next stage is the erection of a small cottage for the nurse. Finally, by the addition of a ward or the construction of a properly equipped hospital the personnel of the centre becomes capable of attending to most illnesses, while the patients have the advantage of being near to their homes and relatives. In the last stage of evolution the nurse or nurses do not attend patients outside the centres. The local practitioners are all entitled to look after their own patients in the hospital. The bush nurses are picked women and in every area I have visited the medical men were emphatic in their appreciation of the value of the help afforded by them. Antenatal supervision is carried out as far as possible, all patients with abnormalities during pregnancy or labour or patients with a history of previous difficult confinements are referred to the nearest doctor. The greatest trouble is taken afterwards to insure breast feeding.

The bush hospital has brought to the small rural township what it could never have obtained otherwise—a modern equipped hospital with a skilled nursing staff, thus insuring the presence of a doctor satisfied to remain in the district and keen to do good work because of his professional surroundings.

Obstetric Nurses in Private Practice.

Not only in the city, but also in country towns great difficulty is experienced in persuading nurses with a double certificate to engage in private practice. The supply is apparently ample, but many take the extra course merely to qualify for positions as matrons. The reluctance to undertake obstetrics is largely caused by the inferior status of the work due to the influence of the untrained nurse, who is prepared to do domestic work in addition. The

general public is largely responsible for this, although in some cases medical men prefer to work with untrained women. All these factors tend to discourage trained nurses from undertaking this branch of their profession. Much education of the general public is still necessary to combat beliefs that any handy woman is better than a well trained nurse.

The Present Status of Obstetric Practice in Victoria.

Although a circular was sent to all practitioners in the State asking for assistance in the shape of records, it was obvious that no true estimate of obstetric practice could be made without personal investigation.

During the year I have visited forty country centres and fourteen of the metropolitan suburbs. The following observations though necessarily incomplete, are based on confidential information obtained by personal interviews with two hundred and thirty practitioners, ninety in the country and one hundred and forty in Melbourne.

I wish to take this opportunity of thanking my colleagues for the invariable courtesy shown to me personally and the desire to assist my investigations in every possible way.

Melbourne and Suburbs.

Conditions vary in different suburbs, but several factors are common to all areas.

The severe competition seen in most suburbs is apt to mould the work and in particular lowers the ideals with which most young men and women start practice. It is easier to do good work in the country than in a crowded industrial suburb where many women are attended in their own homes. A severe handicap is caused by patients engaging their nurse early in pregnancy and not visiting the doctor until near the end or until labour commences. The correct policy of masterful inactivity with a normal case is frequently defeated by the clamours of the patient and her relatives for anaesthesia and quick delivery. Often the nurse sides with them and the doctor's hand is forced. To the young man a contented patient may lead to further cases in the same street. If, in their ignorance, patients consider that he is irresponsible to suffering, then these prospective cases are lost. In the desire for false economy some patients engage a nurse with the understanding that a doctor will be called if required. These nurses frequently work with men of indifferent skill and the results of their interference do not tend to lower the mortality and morbidity rates.

Almost without exception the older men who attend fewer patients, devote more time to them and meet with fewer complications and indications for operative interference. In justice to the younger generation it must be conceded that the senior has more authority, while his refusal to step in and finish a labour prematurely is not met by a request for consultation with some practitioner who, as the nurse knows from past experience, will readily accede to the desires of the patient.

The public needs much more education regarding the dangers and sequelæ of injudicious interference. The profession must combine to raise the dignity of the obstetric art and must also realize that there is a limit to the number of confinements which can be conscientiously undertaken in a given period. When better work is done, then we can expect more adequate remuneration. The average maternity fee is five guineas for first confinements and four for subsequent ones, except in Footscray where the rates are one guinea lower in each case.

Much of the drudgery of obstetrics and the temptation to force the natural sequence of events would be avoided by the establishment of large, modern maternity units in suburbs where accommodation at reasonable rates would be available.

Antenatal Supervision.—Except in some of the industrial suburbs antenatal supervision is good and the public is being rapidly educated to its value. There is no trouble in keeping in touch with *primiparæ*, but most *multiparæ* are irregular in their attendance. The incidence of eclampsia is not more than two or three among one thousand patients in the records of most men. The majority are emergency cases with little or no previous supervision.

Ante partum hæmorrhage occurs in varying proportions and many men hardly ever see this complication. Accidental hæmorrhage is uncommon and the severe types occur mainly in the hospital class of patient. Contracted pelvis of considerable degree is rare. It is difficult to understand why some men seem to have a monopoly of cases, whilst colleagues equally busy in the same suburb hardly ever see one. Exact details of the degree of the pelvic contraction are not usually forthcoming. Too few are given a trial of labour and it would be better if operation were deferred until reputable consultants had concurred as to its necessity. I have collected the records of one hundred and thirty-two Cæsarean sections with a maternal mortality of 10% for all indications. The majority were performed for contracted pelvis, *placenta prævia* and toxæmia. The mortality following this method of treating eclampsia and *placenta prævia* does not compare favourably with that following more conservative methods.

Labour.—The proportion of patients treated in hospital varies from 20% to 80% depending mainly on the suburb and the standards of the local hospitals. Repeated vaginal examinations are still too common, because the busy man relies on the nurse to keep him informed as to the progress of the labour. Some neither permit the nurse to examine nor do so themselves and I have been informed that patients are liable to consider that such omission shows a lack of knowledge on the doctor's part.

Many men consider that of recent years abnormal presentations, for example breech and occipito-posterior, are more common. Most of the difficult forceps deliveries have been unrecognized occipito-posterior cases. The number of men wearing gloves is steadily increasing. Adequate preparation of the vulva is done only in hospitals or where a trained nurse has been engaged.

The number of patients requiring the application of forceps varies from 10% to 80% with individual men. Those who employ them as a routine, are invariably busy practitioners and confess that it is due to pressure of work. Routine application is defended on two grounds: (i.) The saving of the perineum, (ii.) the absence of any bad after effects. On the other hand many men are not so optimistic about the prevention of lacerations with the forceps. While no records have been given in support of these views, the figures of St. George's Hospital, Kew, in a district where the collective skill of the practitioners is certainly not below the average, are instructive. Forceps were applied in the case of 19% of the women and the percentage requiring suture was as great as with those following natural delivery. The total morbidity of all patients was 7%, while that of those who had forceps delivery, was 10.5%.

Pituitary extract appears to have fallen largely into disuse. The majority reserve it for use after the third stage and occasionally earlier with *multiparæ*. A few employ it extensively to hasten delivery and cases of retained placenta, *post partum* hæmorrhage, collapse and one death have been noted. The third stage is fairly well conducted by most men.

Puerperium.—It has been difficult to estimate accurately the amount of sepsis during the puerperium owing to lack of records. In the majority of cases it has followed some operative interference. Men state that most of their septic infections occurred in the smaller type of hospital and not in private homes. The nurse is blamed only in a small proportion of cases.

Records of Hospital and Private Practice.—The intermediate hospitals have fine records. At St. George's Hospital there was one death among four hundred patients and a morbidity rate (British Medical Association standard) of 7%. At Bethesda there have been 1,317 patients with two deaths and a morbidity rate of 3.96%.

In contradistinction the Salvation Army Home for single girls had a mortality of five among five hundred and thirty-one cases. The standard of nursing in this hospital is very good indeed, but it was evidently insufficient to counteract the poor physical condition of many of the girls who had frequently not been under supervision during pregnancy.

Several records of private hospitals in industrial suburbs also show evidence of careful attention to details, for example one hospital with six hundred and eighty patients and no deaths.

The records of private practitioners were very instructive. In one series, quite unselected, of sixteen men who had delivered between one thousand and two thousand women the average mortality was two. Another group of fifteen doctors who had delivered more than two thousand women, had only lost an average of three patients.

No attempt has been made in this report to estimate the amount of chronic ill-health frequently requiring operation as the result of badly conducted confinements.

Country Districts.

In the larger towns the same factors are at work as in Melbourne, but to a lesser extent. Antenatal supervision is not so easily obtained, especially with *multiparae*. Eclampsia is more common than in the metropolis. Contracted pelvis is rare. Records of forty-two Caesarean sections with three deaths (7%) were obtained. The indications were the same as in Melbourne. The forceps rate is low, especially in the smaller centres. It is possible that pituitary extract is used more frequently.

In the smaller townships the men have only an untrained nurse and very indifferent hospital accommodation. It has been most gratifying to observe the way in which the country practitioner has surmounted his difficulties. With most men the nurse is never permitted to examine the patient, the doctor takes his time, abnormalities are rare and the forceps incidence is very low. The tendency is to insist that all patients go into hospital; this results in a saving of much time on long country runs.

Summary.

In any estimation of the standards obtaining in private practice there is a tendency to emphasize the vulnerable points to the exclusion of just recognition of the good work done quietly by the majority. The high ideals constantly set before the students by their teachers are beginning to show results. Perhaps it has been my good fortune that, standing for the moment apart from the daily worries of practice, I can see this improvement more clearly than many others. To the doctor in the small country town and to his companion trying to maintain ideals in a busy suburb, where quantity rather than quality appears to count most, the millennium seems far away. But there are more of these faithful disciples of the obstetric art than is often suspected. Paradoxical as it may seem, the first result of an awakened professional conscience will be an increase in the number of deaths registered and a rise in the statistical rate due entirely to more accurate certification of the cause of death. By this means we shall know more truly where we stand and not allow the present state of affairs to continue while we shelter behind a fictitiously low mortality rate.

Hard work will still have to be done before some of our colleagues and the general public are educated to better standards, but I am convinced that in Victoria at least the start has been made by the majority in the profession.

CLINICAL AND LABORATORY INVESTIGATIONS

Owing to different economic and climatic conditions in Australia it was considered advisable to determine whether the standards accepted in other countries were applicable here. This investigation is still in progress and no final decisions can be as yet reported.

At the Women's Hospital the members of the obstetric staff have devoted much attention to improving their results by standardization of technique.

Dr. John S. Green has collaborated with Associate Professor J. W. Young and Miss Vera Krieger, of

the Biochemical Department of the University, in a study of the toxæmias of pregnancy in which they are attempting to correlate the biochemical and clinical findings in a group of these cases.

The members of the honorary gynaecological staff of the Women's Hospital have placed their beds in the isolation ward at the disposal of Dr. Edward R. White, who has been studying cases of puerperal infection, first with Miss F. Eleanor Williams and later with Dr. Lucy Bryce of the Walter and Eliza Hall Institute for Research in Pathology and Medicine.

In addition to these main lines of research Dr. W. Ivon Hayes has been investigating Gwathmey's technique for narcosis in labour.

Detailed accounts of these investigations will be presented in the final report next year.

THANKS.

I desire to express my appreciation of the assistance given by the State Minister of Health, the Honourable Stanley S. Argyle, M.L.A., through the Health Department in affording opportunities for inspection of all obstetric hospitals. No obstacles have been raised and all questions have been answered without reserve.

The committee of the Women's Hospital placed the resources of the hospital at my disposal and I owe a deep debt of gratitude to the members of the honorary medical staff for their valuable collaboration.

My warmest thanks are due to Mr. Lang, of the Victorian Statist Department and to Mr. Dwyer, of the Federal Bureau of Census and Statistics not only for the interest taken in the subject, but also for the work involved in the compilation of the tables.

Finally, this investigation could not have been undertaken without the loyal cooperation of the profession throughout the State.

DENGUE AS A CAUSE OF DEATH.

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DENGUE is not generally considered a fatal disease although a liability to complications and troublesome sequelæ is recognized. According to Sir Leonard Rogers⁽¹⁾: "Dengue fever . . . has no mortality except rarely in old or feeble subjects, but may leave much debility." Manson-Bahr⁽²⁾ says: "In uncomplicated dengue the mortality may be said to be almost nil (0.1%, Hare). In the case of very young children convulsions and delirium may occur and cause anxiety and in the aged and infirm and in

those suffering from chronic exhausting disease an attack of dengue may prove a serious complication."

The reference of Manson-Bahr to Hare's figures is of interest since Hare's article on "The 1897 Epidemic of Dengue in North Queensland"⁽³⁾ gives an exceptionally clear and detailed account of the disease. Hare quotes Davidson⁽⁴⁾ as saying: "Dengue is never fatal except in the case of old or otherwise worn-out subjects. . . . The few deaths that occur in patients suffering from dengue are the result of some anterior or intercurrent affection, rather than of the disease itself." Hare then proceeds:

This statement is certainly not true of the North Queensland epidemic under consideration. I have collected some account of sixty fatal cases occurring in North Queensland during the epidemic of 1897. Half the number were adults. In many, pre-existing disease or unfavourable antecedent conditions appeared to determine the fatal issue. Amongst these were old age, diabetes, chronic bronchitis, opium-smoking, pregnancy and especially alcoholism. . . . Complications were responsible for three deaths, septic endocarditis one, hæmatemesis two. In many cases, however, death must be attributed directly to the severity of the disease. Thus at Normanton in ten adult fatal cases the mode of death was by rapid hyperpyrexia and coma in all; and the same applies to many that occurred in Townsville. It is, however, mainly in considering the mode of death amongst children that Davidson's dictum is found to be at fault. I have some account of at least thirty cases and in nearly all of these death must be, I think, attributed to the intensity of the uncomplicated disease. Moreover, the manner of death was in the majority almost identical, viz. by rapid heart failure and collapse occurring at the period of crisis. . . . It is evident, therefore, considering the enormous number of persons attacked, that the case mortality must be remarkably low, probably below 0.1%. Yet to regard it as nil is incorrect. . . . It has been observed that as epidemic succeeds epidemic, the disease appears to become more severe and fatal cases more frequent. Certainly in Charters Towers during the first epidemic or two, fatal cases were hardly heard of, while during the last at least eighteen occurred. This may be accounted for in part, but only in part, by errors in diagnosis.

In the discussion by the Medical Society of Queensland, following Hare's address, Love⁽⁵⁾ stated that: "The majority of deaths in Brisbane occurred from hyperpyrexia, in Northern Queensland from collapse."

In 1905 Millard⁽⁶⁾ in discussing the possibility of unrecognized cases having preceded the discovery of a case of bubonic plague at Lismore in May, 1905, recorded that: "Three deaths in March and April had been certified as due to dengue fever. This disease is seldom fatal." On investigation it was found that these patients had not presented symptoms typical of dengue, although cases of dengue had occurred in Lismore concurrently with a widespread epidemic in Brisbane.

Describing the 1911 epidemic at Brisbane, Kerr Scott⁽⁷⁾ stated that: "The prognosis of dengue is favourable, except when it supervenes upon a constitutional ailment, such as *diabetes mellitus*."

In the International List of Causes of Death (Third Decennial Revision by International Commission, 1920), dengue is included under "Title I, Epidemic, Endemic, Infectious Diseases, Sub-title 25, other Epidemic and Endemic Diseases." That is,

provision is not made for the separate tabulation of deaths from dengue unless epidemic prevalence is reached, a footnote to the International List setting out that:

Should any of the diseases included under sub-title 25 (C) show marked prevalence, it will be necessary to provide additional sub-titles here.

In the Australian records of mortality, the reports on vital statistics by the Commonwealth Statistician and the Registrars-General of the several States, the deaths that have occurred from dengue since 1907 have been in accordance with the International List generally incorporated under the term "other epidemic and endemic diseases." In the reports for Queensland, however, deaths from dengue are recorded for the following years, the first appearance of the term being in 1895:

TABLE I.—DEATHS FROM DENGUE IN QUEENSLAND.

Year.	Number of Deaths.	Year.	Number of Deaths.	Year.	Number of Deaths.
1895 ..	26	1905 ..	201	1913 ..	10
1896 ..	4	1906 ..	24	1914 ..	8
1897 ..	97	1907 ..	18	1915 ..	9
1898 ..	87	1908 ..	9	1916 ..	65
1899 ..	10	1909 ..	6	1917 ..	7
1900 ..	7	1910 ..	19	1918 ..	4
1901 ..	13	1911 ..	85	1919 ..	2
1902 ..	10	1912 ..	10	1921 ..	2

Inexact diagnosis is probably reflected in the classification adopted. In 1895 the Registrar-General stated that: "It appears that the medical men of the Colony are somewhat divided as to the nature of the above-mentioned disease (*id est* dengue) some holding it to be a specific disease, others that it is relapsing influenza fever and others again that it is synonymous with simple continued fever." Dengue was until 1902 shown as a sub-title of influenza, from 1903 till 1906 as a subtitle of malaria, in 1907 the international (Bertillon) system was adopted. There is to be noted in these Queensland statistics an indication of the cyclical prevalence of dengue.

In Western Australia only is dengue a notifiable disease, but in that State in no year does the Registrar-General show dengue as a specified cause of death in his annual reports. The number of cases notified each year between 1917 and 1925 were: 0, 0, 271, 38, 41, 12, 30, 0, 0; these cases were all reported from the north-west coast.

In Townsville Mitchell⁽⁸⁾ has made an analysis of the death register and found in the files of death certificates between the years 1895 and 1923 fifty-two deaths attributed to dengue, compared with nineteen deaths from malaria in a total of 7,818 deaths from all causes during this period.

The Australian experience would, therefore, indicate that dengue can function as a cause of death, although the case mortality is exceedingly low, but is liable to variation in different epidemics.

Commencing in the latter part of 1925 there developed between the months of January and May of this year an extensive epidemic of dengue in

TABLE III.—ANALYSIS OF DEATH CERTIFICATES ON WHICH DENGUE WAS SHOWN AS A CAUSE OF DEATH, BY AGES, NEW SOUTH WALES AND QUEENSLAND, FIRST AND SECOND QUARTERS, 1926.

Certified Cause of Death.	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 and over	Total.
Dengue as Only Cause of Death.	4	1	1	—	—	—	—	—	1	1	1	1	1	1	2	2	16
<i>SEPSIS et cetera</i> —																	
Septic parotitis	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1
Otitis media	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Ulcer of leg, gangrene, sepsis	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1
<i>CEREBRAL et cetera</i> —																	
Cerebro-spinal meningitis	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Cerebral meningitis	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Meningitis	1	2	1	2	—	—	—	—	—	—	—	—	—	—	—	—	6
Meningitis and pneumonia	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1
Encephalitis	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1
Meningismus	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	2
Cerebral hæmorrhage	1	—	—	—	—	—	—	1	—	—	1	—	—	1	1	—	5
Paralysis of vagus nerve	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
Laryngeal & pharyngeal paralysis	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1
Convulsions	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Delirium	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1
<i>HEART</i> —																	
Heart failure	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	4	5
Heart failure and debility	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Heart failure and child-birth	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	2
Myocarditis	—	—	—	—	—	—	—	1	—	—	—	—	1	—	—	—	2
Myocardial degeneration	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1
Endocarditis	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	2
Valvular disease	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	2
Fatty degeneration of heart	—	—	—	—	—	—	—	—	1	—	—	—	—	1	—	—	2
Cardiac asthma	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1
Cardiac neurasthenia, pleurisy	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1
<i>CHEST</i> —																	
Pneumonia	—	—	1	1	—	—	—	—	—	—	1	1	1	—	—	1	6
Pneumonia, cerebral congestion, meningitis	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Lobar pneumonia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Broncho-pneumonia	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1
Broncho-pneumonia and thermal fever	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1
Septic pneumonia, postfebrile delirium	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1
Hypostatic pneumonia	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1
Congestion of lungs	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	2
<i>ABDOMINAL</i> —																	
Gastritis	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Gastro-enteritis	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Enterocolitis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acute appendicitis	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1	2
Peritonitis	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1
Hæmatemesis	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Vomiting	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
<i>OTHER</i> —																	
Acute nephritis	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1
Miscarriage	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1
Senility	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	3	5
Prematurity	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Asthenia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Hyperpyrexia	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
<i>SEPSIS et cetera</i> —																	
Tonsillitis after throat operation	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Septic arm and pulmonary embolus	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1
<i>CEREBRAL et cetera</i> —																	
Syringomyelitis	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1
Cerebral hæmorrhage	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Cerebral apoplexy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Syncope and debility	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Hemiplegia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Paraplegia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Acute bulbar paralysis	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1
Cerebro-spinal sclerosis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Mental deficiency	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Neurasthenia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
<i>HEART</i> —																	
Heart failure	—	—	—	—	—	—	—	—	1	—	—	—	—	1	1	—	2
Angina pectoris	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Morbus cordis	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Myocarditis	—	—	—	—	—	—	1	—	—	—	1	—	—	1	—	—	5
Valvular disease	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Mitral regurgitation	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1
Chronic endocarditis and carcinoma	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Congenital heart disease	—	—	—	1	—	—	—	—	—	—	—	—	1	—	—	—	1
<i>CHEST</i> —																	
Pneumonia	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Broncho-pneumonia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
Chronic bronchitis	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1
<i>ABDOMINAL</i> —																	
Colitis	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	2
Duodenal ulcer	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1
<i>OTHER</i> —																	
Chronic nephritis	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	—	3
Pernicious anæmia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Diabetes	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	2
Chronic rheumatism	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	2
Rheumatic fever, mitral stenosis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Whooping Cough	2	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	3
Cretinism	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Fibro-myoma of uterus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Senility	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8
Senility and hypostatic pneumonia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Total Deaths, I.-II. Quarters, 1926	20	6	7	7	6	3	6	5	7	4	8	7	8	13	7	33	147
Total Deaths, Queensland, 1895-1921	156	38	26	27	42	30	39	31	35	42	37	38	43	31	37	81	733

Dengue as primary cause; secondary cause certified as:

Dengue as secondary cause; primary cause certified as:

be attributed only to those deaths in which dengue was certified as a sole or as a primary cause of death, ninety-two in all, the case mortality is computed as 0.02% compared with Hare's estimation of 0.01% during the Queensland epidemic of 1897.

Dengue was entered as the sole cause of death on sixteen certificates, as a primary cause of death on seventy-six and as a secondary cause of death on fifty-five certificates (Table III.). It is noteworthy that eighty associated causes of death were specified, accepting the somewhat varied nomenclature adopted in certification. On comparison with the general mortality experience of previous years, it is not possible to show any statistically significant association between dengue and any individual cause of death. There is, however, a significant indication of the fatal course of dengue in the associated causes of death grouped as "cerebral *et cetera*" and "chest" conditions. The predominance of nervous symptoms in dengue has been widely noted and possibly the mortality experience of this epidemic confirms the symptomatic evidence. It would also appear that pulmonary complications are a definite feature of dengue as it appears in Australia. These mortality figures indicate a confirmation of the generally accepted opinion that an attack of dengue may prove a serious complication in persons suffering from chronic diseases and in the aged and infirm. Moreover, evidence is provided that uncomplicated dengue in itself can function as a truly primary cause of death, although the mortality rate per total cases is extremely low.

The age distribution of deaths shows deaths at all ages, but mainly in the early and late years of life. Eleven deaths occurred under one year of age and twenty-three over eighty years of age. The youngest person was an infant, aged four days; death was attributed to dengue and prematurity. The oldest person was a female, aged one hundred and eight, whose death was attributed to senility and dengue.

The sex distribution of deaths (Table II.) shows the death of eighty-three males and of sixty-four

females, compared with the death of four hundred and eight males and of three hundred and twenty-five females in Queensland during the years 1895-1921.

The monthly distribution of deaths (Table IV.) is more or less comparable with the earlier Queensland experience, but maximum mortality is somewhat earlier than is indicated by the table of monthly deaths in Queensland between 1895-1921.

The statistical findings of such an analysis as this may give little of clinical value, but consideration of the question does bring under attention certain points of statistical and epidemiological importance.

1. There is indicated a definite need for practitioners to bear in mind the statistical significance of entries made by them on certificates of death. Many of the terms used in this small sample of certificates are included in the lists of undesirable terms to which attention has been repeatedly called by statisticians. "Thermal fever," "heart failure," "septic pneumonia" are obviously indefinite terms even when entered as a secondary or terminal cause of death.

2. The lack of morbidity data on which to base exact case mortality rates, is from the statistical point of view unfortunate. But consideration of the notification of dengue raises the whole question of the value of notification of disease and especially of such a disease as dengue in which many patients are never seen by medical men and notification to be complete must rely on dual notification by the medical attendant and the householder.

In 1912 Thomas Bancroft⁽⁹⁾ wrote:

At the present time it would be useless to make dengue fever notifiable for the reason that medical practitioners call half a dozen different diseases by that name.

Commenting on the number of cases notified in Western Australia during the years 1923-1924, the Commissioner of Public Health⁽¹⁰⁾ reported that:

The ætiology of this disease is not thoroughly understood and the diagnosis is somewhat uncertain, except, perhaps, during epidemic periods. It is quite possible that scattered cases may be missed, especially in non-epidemic periods and it is also possible that a change of doctor in a district might lead to an alteration in the number of cases recognized.

Granting the diagnostic limitations of the medical profession, it is useless to expect reliable notification by householders in such a disease as dengue. The matter resolves itself into a question whether the unreliability of the available statistics altogether invalidates the use of notification as an administrative measure aiming at control of the disease. Theoretically, notification should enable a more exact knowledge to be obtained of the course of the disease and of its mortality, morbidity and invalidity rates; it should insure some localized effort at control in the environment of the patient and it should enable the sanitarian to emphasize the high economic rate of work days lost and to assess the value of the control measures applied. But obviously the adoption of mosquito control

TABLE IV.—DEATHS FROM DENGUE REGISTERED BY MONTHS, FIRST AND SECOND QUARTERS, 1926, AND TOTAL DEATHS FROM DENGUE IN QUEENSLAND, 1895-1921.

Months.	Deaths in Queensland, First and Second Quarters, 1926.	Deaths in New South Wales, First and Second Quarters, 1926.	Deaths in Queensland, 1895-1921.
January	1	0	42
February	21	0	42
March	35	10	126
April	34	10	169
May	19	7	131
June	6	4	65
July	—	—	45
August	—	—	25
September	—	—	23
October	—	—	22
November	—	—	22
December	—	—	21
Total	116	31	733

measures cannot await notification of the presence of a disease that is characterized by an extraordinary suddenness of rise and of establishment of epidemic prevalence. The cyclical appearance of dengue would indicate at least a periodic interest in the measures prescribed by regulation under the *Health Act* of Queensland and by ordinance under the *Local Government Act* of New South Wales. The application of these measures should be made in an endeavour to anticipate the appearance of dengue for the evanescent enthusiasm of local authorities that follows each epidemic is an example of mistimed energy.

3. It may be considered that an estimated case mortality rate of 0.03% is negligible, but as Hare pointed out in 1898: "To regard it as nil is incorrect." It will be remembered that Hare also made the statement that: "As epidemic succeeds epidemic the disease appears to become more severe and fatal cases more frequent." Should the recurrent epidemics of 1895, 1897, 1898 ever be repeated, it is obvious that dengue must be considered as something more than a periodic inconvenience to be endured by communities that share with *Aedes argenteus* (*Stegomyia fasciata*) a climate that lacks the rigours of the immune southern parts of Australia.

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AUTOGENOUS VACCINES IN INFECTIONS OF THE RESPIRATORY TRACT.

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IN the analysis of the work of the last twelve months we were struck by the greatly increased demand for autogenous vaccines in the treatment of infections of the respiratory tract. Although doing consultation work only, we were naturally interested to know the therapeutic value of this line of treatment and obtained detailed accounts of patients so treated from the clinicians concerned.

To render the subject less bulky we obtained records from only four physicians and we shall confine the analysis to approximately one hundred cases.

Clinical Records.

To obtain accurate records and original diagnosis each clinician was supplied with a list of his own patients from our records. The practitioner concerned was asked to state briefly the original diagnosis, the result of treatment, whether the patient was cured, improved or not improved, and whether result was attributable to vaccine alone or to vaccine in addition to other medical therapy. Thus we have obtained all our results with patients seen in the course of "private practice." We have purposely refrained from including any hospital patients for the following reasons. (i.) It is practically impossible to attain any standard of "resistance to infection" in the poorer types of the community. We could not be sure whether the diet, housing conditions, clothing and artificial warmth procurable in winter by these people were satisfactory. When a patient is ill-nourished, scantily or incorrectly clad and in addition is devoid of home comforts which make for the maintenance of a good general resistance to infection, we concluded it would be more difficult to secure success with vaccine therapy. (ii.) In private practice we know that the patients come regularly for treatment and the dosage and reactions can thus be studied accurately. With hospital patients who attend only once a week, if they can manage to spare the time from their daily toil, we know from experience that we could expect little in the way of results capable of tabulation. (iii.) The more or less irregular attendance of the average hospital out-patient militates against the really successful use of vaccine therapy. This form of therapy must above all be individualistic. Personal idiosyncrasy towards vaccines is even greater than towards drugs exhibited. The personal equation in every patient has to be studied. People cannot be treated with vaccines unintelligently and by rule of thumb. Each patient is a law unto himself in the acquisition of immunity and his individual resistance must be raised by doses of autogenous

vaccine increased or altered according as his reactions are suitable or otherwise. Obviously such individual care and study of each patient is not feasible under our present hospital out-patient system and so results of vaccine therapy in public hospitals cannot be taken as a standard by which to judge merits or faults.

We are also firmly convinced that, unless each individual patient be separately studied in his reactions, dosage and so forth, even the private patient will give disappointing or inconclusive results.

As soon as we had obtained the desired information from the physicians concerned, an effort was made to group the patients and the analysis of results is as follows.

The number of patients is considered as one hundred.

Group A.—Pulmonary tuberculosis with pronounced secondary infection; six patients.

Date.	Patient.	Result.
March 30, 1926 ..	Mrs. L.	Improved.
March 6, 1926 ..	Mr. M.	Improved.
July 27, 1925 ..	Mr. S.	Died (prognosis hopeless when treatment commenced).
May 16, 1925 ..	Mrs. McL.	Improved considerably, when first seen prognosis appeared hopeless.
March 21, 1925 ..	Miss H.	Improved considerably, although it seemed that this patient would die in three months.
	Mr. C. F.	Improved.

These patients although few in number, are decidedly encouraging as out of six so treated, three have shown definite improvement and in two others the improvement has been very definite.

Group B.—Recurrent "colds" or influenzal attacks; sixty patients.

Patient.	Result.	Result due to Vaccine Alone or with Other Therapy.
Mr. C. ..	Considerably improved	Vaccine alone.
Mr. S. ..	Improved	Vaccine alone.
Mr. S. U. ..	Cured	Vaccine alone.
Mrs. T. ..	Cured	Vaccine alone.
Dr. H. ..	Cured	Vaccine alone.
Mr. G. ..	Cured	Vaccine alone.
Mr. D. ..	Cured	Vaccine alone.
Mr. McC. ..	Cured	Vaccine alone.
Mr. P. ..	Improved	Vaccine alone.
Miss E. P. ..	Improved	Vaccine alone.
Miss L. ..	Improved	Vaccine alone.
Mrs. V. R. ..	Improved	Vaccine alone.
Mr. C. ..	Improved	Vaccine alone, had only four injections.
Mr. Y. ..	Improved for 12 months, recurred	Vaccine alone.
Mr. D. ..	Improved	Vaccine alone.
Mr. B. ..	Improved	Vaccine alone.
Mrs. McD. ..	Cured	Vaccine alone.
Mr. W. ..	Improved	Vaccine alone.
Miss L. ..	Improved	Vaccine alone.
Mrs. G. P. ..	Cured	Vaccine alone.
Mr. H. ..	Cured	Vaccine alone.
Mr. E. H. ..	Cured	Vaccine + <i>Bacillus bulgaricus</i> .
Mrs. E. H. ..	Cured	Vaccine + <i>Bacillus bulgaricus</i> .
Mr. O. ..	Cured	Vaccine alone.
Dr. M. ..	Improved	Vaccine alone.
Mr. B. ..	Improved	Vaccine alone.
Dr. F. ..	Cured	Vaccine alone.
Mr. G. ..	Cured	Vaccine alone.
Mrs. D. ..	Cured, free for three years	Vaccine alone.
Dr. C. ..	Improved	Vaccine alone.
Mr. A. ..	Cured	Vaccine alone.

GROUP B.—Continued.

Patient.	Result.	Result due to Vaccine alone or with other Therapy.
Dr. U. ..	Improved	Vaccine alone.
Dr. W. ..	Improved	Vaccine alone.
Mr. H. ..	Cured	Vaccine alone.
Nurse H. ..	Cured	Vaccine alone.
Mrs. E. J. ..	Cured	Vaccine alone.
Mr. R. B. ..	Cured	Vaccine alone.
Captain W. ..	Cured	Vaccine alone.
Mrs. H. ..	Cured	Vaccine alone.
Mrs. H. ..	Immunity for two years	Vaccine alone.
Mr. McL. ..	Improved	Vaccine alone.
C.H. ..	Improved	Vaccine alone.
Mr. K. ..	Improved	Vaccine alone.
M.S. ..	Improved	Vaccine alone.
Miss M. ..	Cured	Vaccine alone.
Mr. G. ..	Cured	Vaccine alone.
Miss H. ..	Cured	Vaccine alone.
Mr. B. ..	Improved	Lost trace after a few injections.
Mr. D. ..	Improved	Vaccine alone.
Mr. B. ..	Cured	Vaccine alone.
Mr. H. ..	Immunity for twelve months	Vaccine.
Miss S. ..	Improved	Vaccine.
Mr. T. ..	Improved	Vaccine.
Mr. D. ..	Improved	Vaccine.
Mrs. E. ..	Improved	Vaccine alone.
Mr. S. ..	Cured	Vaccine alone.
Mrs. McC. ..	Cured	Vaccine alone.
Mrs. P. ..	Cured	Vaccine alone.
Mr. T. ..	Cured	Vaccine alone.
Miss G. ..	Improved	Vaccine alone.

This series comprises sixty patients. Of these thirty-one were pronounced cured and enjoyed periods of immunity ranging from twelve months to three years. The number of patients pronounced improved was twenty-seven and two were entered as definitely improved.

Group C.—Rhinitis; seven patients.

Patient.	Diagnosis.	Result.	Result Due To.
Miss K. ..	Rhinitis	Improved	Vaccine alone, but did not continue.
Miss W. ..	Rhinitis	Improved	Vaccine (also nasal operation.)
Mrs. D. ..	Rhinitis	Improved	Vaccine alone.
Mr. J. ..	Purulent rhinitis	Cured	Vaccine alone.
Dr. D. ..	Recurrent rhinitis	Cured	Vaccine alone.
Mrs. M. ..	Recurrent nasal catarrh	Improved	Vaccine alone.
Dr. B. ..	Persistent rhinitis	Cured	Vaccine alone.

The condition of these patients was diagnosed as rhinitis by their physicians. Of the seven, three were pronounced cured and the remaining four were improved.

Group D.—Asthma; eight patients.

Patient.	Diagnosis.	Result.	Result Due To.
Mr. S. ..	Hay Fever asthma	Cured	Vaccine alone.
Mrs. A. ..	Bronchial asthma	Cured	Vaccine and potassium iodide.
Mr. B. ..	Hay fever	Cured	Vaccine alone.
Mrs. S. ..	Asthma	Improved	Vaccine alone.
Mr. W. ..	Asthma	Definitely improved	Vaccine.
Mrs. Y. ..	Asthma	Cured	Vaccine.
Mrs. V. ..	Asthmatic Bronchitis	Improved	Vaccine and nasal polyp removed.
Miss H. ..	Asthma and hay fever	Cured	Vaccine.

Of these eight patients five were certified as cured, two as improved and one as definitely improved.

Group E.—Bronchitis; eleven patients.

Patient.	Diagnosis.	Result.	Result Due To.
Miss N. ..	Purulent bronchitis	Cured	Vaccine alone.
Mrs. C. ..	Bronchitis	Improved	Vaccine alone.
Miss V. ..	Bronchitis	Considerably improved	Vaccine alone.
Mrs. R. ..	Bronchitis	Considerably improved	Vaccine alone.
Mrs. O'N. ..	Bronchitis	Considerably improved	Vaccine alone.
Mrs. A. ..	Bronchitis	Improved	Vaccine alone, other medical therapy.
Mrs. C. ..	Bronchiectasis	Improved	Vaccine and other medical therapy.
Mrs. H. ..	Abscess of lung	Considerably improved	Vaccine.
J.H. ..	Bronchitis	Cured	Vaccine and potassium iodide.
Miss C. ..	Bronchitis, emphysema	Cured	Vaccine alone.
Master H. ..	Bronchitis	Cured	Vaccine alone.

The analysis of the eleven patients with bronchitis is as follows: Cured four, considerably improved four, improved three.

Group F.—Fibrositis following influenzal attack; three patients.

Patient.	Diagnosis.	Result.	Result Due To.
Mrs. V. ..	—	Cured	Vaccine alone.
Dr. H. ..	—	Cured	Vaccine alone.
Miss H. ..	—	Improved	Vaccine alone.

Of the three patients with fibrositis following influenza two were cured and one improved by vaccine treatment.

Group G.—Pansinusitis; six patients.

Patient.	Diagnosis.	Result.	Result Due To.
Mr. S. U. ..	Pansinusitis	Cured	Drainage of maxillary sinus, and vaccine
Mrs. C. ...	Pansinusitis	Improved	Vaccine alone.
Miss V. ..	Pansinusitis	Considerably improved	Vaccine alone.
Mrs. R. ..	Pansinusitis	Considerably improved	Vaccine alone.
Mrs. O'N. ..	Pansinusitis	Considerably improved	Vaccine alone.
Mrs. A. ..	Pansinusitis	Considerably improved	Vaccine alone.

One patient of this group was cured, three were considerably improved and one was improved.

Scanning these varied lists we felt justified in reaching the conclusion that autogenous vaccines in all the types of infection listed above were of distinct value. Naturally, it is difficult to trace all patients to ascertain how long their period of immunity lasts, but in several instances when we are in constant contact with the persons treated, we find such treatment to have an enduring prophylactic value. Periods varying from a year to eighteen months and even (in one case) three years have elapsed without the particular person treated showing any infection

of the respiratory tract, even escaping the ubiquitous "common cold."

As the tendency at present is to regard vaccine therapy in these types of infection as of unproven value, we are inclined to attribute these eminently satisfactory results in part at all events to the technique we employ in the preparation of these vaccines.

The pulmonary tuberculosis patients in whom secondary infection with pneumococci, influenza bacillus and streptococci was determined by Gram-stained smears of the sputum, were in the opinion of their physicians being rendered doubly toxæmic by this secondary infection; we were therefore asked to make autogenous vaccines from their sputum. In practically all the patients the toxæmia was greatly lessened, the amount of sputum became gradually diminished and on being sent to suitable climates these patients are all holding their own remarkably well.

In regard to the asthmatics the possibility of non-bacterial foreign protein sensitivity was eliminated as far as possible by the physicians. On the assumption that the asthmatic spasms may be due to the irritation of the diseased bronchial mucosa and the nerve-endings therein, it was decided to try to eliminate the concurrent bronchitis by vaccine therapy. Again it is possible that the swollen and inflamed tracheo-bronchial lymphatic glands press on the vagus nerve branches and so cause spasm of the bronchioles. These alternate theories are hardly proved, but are generally recognized amongst American physicians, following on the work of Kuhns, of Chicago.

However, it was found that when by the use of an autogenous vaccine the bronchial inflammation was cured, the asthmatic spasms were arrested.

Preparation of Vaccines.

The method used for the preparation of these vaccines was as follows.

Coryza and Bronchitis.

Swabbings from patients referred to us were taken from the right and left posterior nares, care being exercised to exclude contamination from the vibrissæ of the nostrils by inserting an ordinary aural speculum and passing the sterile swab-stick through this.

Swabbings were also obtained from the posterior nares by means of "West tubes" inserted over the soft palate. If mucopus was found to be dropping down from the posterior nares, the patients were instructed to wash their mouths thoroughly and to snuff this material down over the soft palate and expectorate it into a sterile pot. From the swabbings and the mucopus so obtained cultures were made as will be described later.

Chronic and Acute Bronchitis, Pulmonary Tuberculosis and Abscess of the Lung.

In chronic bronchitis, acute bronchitis, pulmonary tuberculosis, bronchiectasis, lung abscess and in other conditions with sputum the patient referred to us was given a sterile sputum pot and instructed

to wash his mouth thoroughly on awakening in the morning with at least a pint of previously boiled water and then to cough deeply and strongly into the sterile pot which was closed at once with its screw lid. This specimen was brought into the laboratory on the same morning and from it cultures and films were made.

Cultural Characteristics of Bacteria.

As a routine procedure all such material was examined for the presence of tubercle bacilli and also by differential staining of films to ascertain the types of organisms present and their relative scarcity or abundance in the specimen. Thus we had a guide in the making of cultures as to the amount to be used for sowing, in order to obtain a satisfactory growth in twenty-four hours.

These preliminary smears invariably revealed the presence of the pneumococcus. Associated with this organism in 90% of cases occurred *Bacillus influenzae* (Pfeiffer). We generally found several or all of the following in varying proportions: Friedländer's pneumobacillus, *Streptococcus pyogenes*, *Streptococcus mucosus*, *Staphylococcus aureus* and in many cases *Micrococcus catarrhalis*, *Micrococcus pharyngis siccus* and other chromogenic cocci. The cultural characteristics of these organisms formed the guide to our selection of medium, hydrogen ion concentration of that medium, optimum temperature for growth and other details. A short résumé of these characteristics is therefore needed.

The pneumococcus (of Fränkel) appears in pathological material as two lancetolate bodies with bases apposed set in a capsule. Sometimes it forms short chains, but these chains are always composed of the typical diplococci. It does not grow below 30° C., the optimum temperature being 37° C. and is best cultivated on blood-serum or blood-agar. Usually the pneumococcus quickly loses its virulence and so, we presume, its antigenic value. Its virulence is greatly attenuated by subculturing.

E. R. Stitt, the eminent American naval pathologist and bacteriologist, has stated that usually the pneumococcus quickly loses its virulence and even dies out in a few days unless transferred to fresh media. "Virulence is quite variable; it is attenuated by subculturing and exalted by animal passage." The same authority has pointed out that "the best medium for its preservation is blood-agar; this also maintains its virulence."

Pneumococci have been divided into four types, but as each patient supplies his own material for culture, we presume that he receives in his vaccine the particular type of pneumococcus causing his trouble.

The pneumobacillus of Friedländer occurs in a bacillary-coccoid form, sometimes in pairs and also has a capsule. It is, however, Gram-negative and grows in large viscid colonies. It grows best on blood-serum or blood-agar media.

Bacillus influenzae (Pfeiffer) is a very small bacillus which tends to show itself in sputum in aggregations around clumps of pneumococci or *Micrococcus tetragenus*. It stains faintly and with the ordinary Gram counterstain is practically in-

distinguishable. But a Gram film of sputum counterstained with formol-fuchsin or weak carbol-fuchsin shows it up as small rods $0.5 \times 0.24 \mu$. Involution forms have also been noted and at times the staining tends to be deeper at both ends of the rod, so that a diplococcal appearance is given. This organism is easily missed unless special care be taken to demonstrate its presence and as we attribute paramount importance to it in these infections, we are constantly on the alert. Personally we are convinced that the more or less doubtful success of vaccine therapy in respiratory diseases in the past was due to failure to recognize this organism and to cultivate it successfully in order to incorporate it in vaccines. Patients suffering from pulmonary tuberculosis are prone to become carriers of the influenza bacillus and it is liable to be present in the sputum of such patients for long periods. Various workers have shown that the Pfeiffer bacillus is present in the throats of normal individuals as well as in those suffering from other diseases. For example Sellards isolated this bacillus from the sputum and conjunctival secretion of twenty-five out of thirty-one patients suffering from measles. We have not, however, found it universally in normal throats, but in practically all respiratory tract inflammatory processes including anginas it has been demonstrated along with other organisms. The one constant factor, indeed, in the varying bacteriology of the respiratory tract is, we find, the presence of Pfeiffer's bacillus. This fact may quite well be an aftermath of the influenza epidemic a few years ago and it is possible that far more cases exist since then than prior to this epidemic. In seventy-eight autopsies on persons who died of postinfluenzal pneumonia in the American Expeditionary Force, Holm and Davidson obtained pure cultures from lungs of *Bacillus influenzae* seven times, type IV. pneumococcus seventeen times, *Streptococcus haemolyticus* nine times and meningococcus seven times. In twenty-three instances *Bacillus influenzae* was found with other organisms. Recently Blake and Cecil have reported successful results by inoculating monkeys intranasally with *Bacillus influenzae* which had been raised in virulence by a passage through animals. The disease in the monkey seemed identical with influenza in man. Thus the pathogenicity of the influenza bacillus has been amply demonstrated. This organism does not respond well to subculturing and its virulence is undoubtedly thereby attenuated; the problem therefore arose as to the method to be adopted in order to obtain sufficient for autogenous vaccine preparation. How this problem was solved will be shown later.

As regards growth the presence of hæmoglobin is necessary, as this is a typical hæmophilic bacterium. Without free and readily available hæmoglobin and moisture, growth does not occur. *Streptococcus pyogenes* is invariably Gram-positive and forms chains. Blood-agar is an excellent medium for its cultivation. The colonies are quite small, but distinct and discrete. *Streptococcus haemolyticus* is often found and in cases of pulmonary tuberculosis the streptococcus is an im-

portant factor of secondary infection. In severe tonsillitis *Streptococcus hæmolyticus* is often isolated and vaccines have a most beneficial effect. "Recent work by Dochez and others would indicate, however, that there are a number of strains of *Streptococcus hæmolyticus* as determined by agglutination and protection tests. It is generally accepted that *Streptococcus viridans* is a name which has been attached to many distinct streptococcal strains" (Stitt). For this reason we lay stress on the importance of the cultures being made from the patient's own material to insure incorporation of his infecting strain of streptococci in his vaccine.

In the respiratory tract infections *Staphylococcus aureus* occurs commonly associated with the influenza bacillus. It is easily grown at 37° C.

Micrococcus catarrhalis appears on culture in white, opaque colonies larger than the pneumococcus colonies, having irregular, wavy borders. The colony is easily picked up from the plate with the loop, but does not emulsify readily. The coarse emulsion shaken with glass beads in a mechanical shaker gives a good, uniform emulsion for vaccine preparation. It occurs in the nasal secretions of healthy persons, but is also responsible for certain coryzas and bronchial affections resembling influenza. Gordon, of Chicago, claims that he was unable to discover any pathogenicity with this group of organism, but we have on a few occasions cultivated them in pure culture and vaccines prepared have given extraordinarily satisfactory results.

Micrococcus pharyngis siccus is a small coccus which grows in white colonies. These are firm and stick to the medium and will not emulsify readily. They grow abundantly at body temperature. The media to be used to grow all these types of organisms satisfactorily and yet in such a way that the different types of colonies could be successfully distinguished, presented a difficulty until after experiments with blood-agar, inspissated serum and other media we finally found the best all round medium was ordinary nutrient agar (pH 7) to which one part of human blood plasma to five of medium had been added when cooling at 50° C., and which also when set was smeared with some sterile serum and hæmoglobin (human). The smear made was always very thin to avoid an excess of moisture. Sterile human blood is obtained and after clotting has occurred, the serum which separates, is gently shaken and a small proportion of red corpuscles are left in suspension in an excess of serum. One drop of this serum-hæmoglobin suspension is pipetted on to each plate and smeared as a very thin film over the plasma-agar. The material for cultivation is then sown in quantity proportionate to the abundance of organisms. Ordinary test tubes of medium were found unsatisfactory and the additional risk of contamination rendered work with Petri plates difficult; eventually all cultures were made in a modification of the Roux flask which gives a large area for discrete growth of colonies, allows for the picking up of colonies and is safer and easier to handle than the Petri plate. Swabbing are sown directly on to these plates, but

sputum or postnasal secretion is first washed in sterile physiological saline solution in order to thin out the cultures. Being firmly convinced that subculturing lessens the virulence and antigenic power of practically all these organisms, especially the pneumococcus and influenza bacillus, we make it a rule to inoculate sufficient flasks to give ample material for the vaccine after twenty-four hours' growth. The preliminary smears made from the material are very helpful in this respect and experience teaches the worker approximately how many flasks are needed. Should the quantity be insufficient, more material is cultured; it is inadvisable to make subcultures from organisms already grown on an artificial medium. Thus, we think, we obtain all these organisms in their greatest virulence possible without having recourse to animal inoculation. After twenty-four hours' incubation at 37° C. the flasks are examined and colonies are identified. Films are made to confirm the identity of the various organisms and, if satisfactory, the vaccine is made.

The different types of colonies are picked off the medium with a special platinum rake and emulsified in 0.5% carbol-saline solution. The various types of organisms are mixed after standardization of the number of bacteria per cubic centimetre of vaccine. The whole vaccine is then left in the water bath at 56° C. for half an hour. In spite of statements made in reference to the spoiling of antigen by the heat, we have not found any appreciable loss of antigenic power. Finally a culture is made to prove sterility.

It is an undoubted fact that subculturing lessens the virulence of the majority of organisms and particularly is this true of the pneumococcus, streptococcus and influenza bacillus. By avoiding the necessity for subculture we feel sure the vaccine prepared has a higher antigenic value for the production of active immunity in the individual treated. The value of the type of vaccine in which organisms are kept in stock, as it were, by repeated subculture, is practically negligible, as the virulence of these organisms is probably much attenuated. Of course, by adopting the method outlined above the amount of culture medium used is enormously increased, but we do not consider it wasted.

The arguments for autogenous as against stock vaccine are legion and will not be recapitulated here, but results as shown above are undoubtedly in favour of the stronger, more virulent organism obtained by first culture.

Whilst not claiming any new discoveries in this field, we feel sure the technique developed and the methods adopted in preparation of the vaccine are sound and productive of the best possible results. This conclusion is borne out by the opinions of the clinicians concerned. We have endeavoured to deal with organisms in as natural a field as possible. Artificial cultivation is unnatural and we therefore seldom go beyond one cultivation.

Summary.

In conclusion, epitomizing the results reached we find that:

1. Care must be exercised in obtaining sputum and other material.
2. Preliminary smears should be made and stained with a modification of Gram's method to demonstrate the organisms; it is especially essential to look for the influenza bacillus.
3. Culture flasks should be inoculated in numbers proportionate to the numbers of organisms previously seen in the films.
4. Hæmoglobin and moisture are essential for the cultivation of the majority of the organisms concerned.
5. Rather than subculture more original material should be used to obtain sufficient organisms of any particular type required.
6. The organisms must be killed in the minimum time and at the lowest temperature which will be efficient.

Reviews.

MODERN CARDIOLOGY.

A CHALLENGING, stimulating racy style characterizes Dr. Francis Heatherley's book on the heart, now in its second edition.¹ Its dedication is set out to read, "This little book is dedicated to those who find salvation in compensatory hypertrophy and who fear a well conducted mitral." He seeks to give a short clear sketch of the present state of knowledge of heart disease for the guidance of the general practitioner. The author was brought up in the tenets of the old school and became converted to the new only after twenty-five years by his experiences in the war and in the Pensions Department. He is a combative writer and heaps scorn and satire on the adherents of the old school of thought. Valve murmurs, enlargement, compensation and back pressure are given their proper perspective. For instance, it is not the valve defect that causes dilatation, but the muscle degeneration; too much importance has been given to murmurs in the past and frequently they are misinterpreted; physiological differences in the position of the apex beat were not sufficiently recognized; the influences of sudden new rhythms like auricular fibrillation in producing heart failure were inadequately stressed. Mechanical difficulties from valve defects were given too much weight in prognosis. An enlargement of the heart is not good in itself as "compensatory hypertrophy" would signify, but a sign of an inefficient heart even in the absence of obvious signs of heart failure. Valve disease is compatible with good function and restrictions may be unnecessary or even harmful; chronic invalidism may be wrongfully induced by mistaking the real character of a physiological murmur. Effort syndrome with or without valve disease has been too frequently overlooked. It is obvious enough that a sharp line of demarcation between the old and the new schools is largely an artificial one, useful for polemics. The ten tenets collected by the author as representing the new school would provoke few quarrels with the alleged old school. That they need emphasizing is another story.

The statement that the ventricle remains at a steady rate in complete heart block, irrespective of posture, exercise or pyrexia, is not strictly correct; variations are not at all infrequent.

Illustrative cases of irregular heart action are nicely given, interspersed with colloquialisms; they form a useful aid in illustrating such types and exemplify the fuller description that follows. The chapters on heart failure and angina are well worth reading; the remarks on the necessity for further observations on blood pressure are

apt and stimulating. "Insufficient attention is being paid to the elucidation of symptoms . . . it is the general practitioner who alone has the opportunity of studying the obscure beginnings of disease" is a statement which echoes Mackenzie's strongly put views. Education of public opinion on this point would check the type of patient who demands to be told what is the matter with him before he tells you anything about his symptoms, to test whether the answer will correspond with his previous doctor's opinion. It is wisely stressed that symptoms afford the earliest evidence of the nature of the disorder and owing to our want of knowledge "diagnosis is deferred until the patient's disorder is apparent to others besides himself."

In regard to prognosis insufficient data by the old school explains its tendency to be mere guesswork. It "resembles the weather portents of an unscientific shepherd rather than the forecast of an up-to-date meteorological bureau." The part dealing with treatment is eminently practical; for instance, "unless there is evidence of excess there should be no interference with a man's habits as regards tobacco and alcohol . . . the old gentleman's night cap of a tot of whiskey may not sound as respectable, but is probably less harmful than chloral." The statement that fibrillation in old people is usually unsuccessfully treated with digitalis is repeated from book to book, as in this one, with quite unnecessary pessimism.

The author seems to lose his usual dash when he states that heart rates below 100 do not require digitalis.

In fibrillation, refractory to digitalis, it is advised that double the dose of tincture of strophanthus be given instead. According to the context this would mean two mils (thirty minims) four times or four mils three times a day. The last British Pharmacopœia states 0.12 to 0.24 mil (two to four minims) as the dosage, so that these doses sound more heroic than wise, certainly the British Pharmacopœia doses can be doubled with perfect safety and to avoid hydrolysis should be prescribed as drops.

The book closes with an appendix dealing with a form of instruction on the home treatment of functional heart disorders, issued to pensioners. This gives an account in popular language of the main points in organic and functional conditions with the effects produced through the nervous system. It is twenty pages in length and is very readable. It is just the sort of thing to hand to patients and can be purchased in England for three shillings a dozen copies.

Dr. Heatherley has a style all his own, colloquial, racy and epigrammatic; there are few dull pages and a great deal that is very helpful. The book can be heartily recommended.

TEACHING BY PICTURES.

SUCH a book as "An Atlas of Midwifery" by Dr. Comyns Berkeley and Dr. G. M. Dupuy¹ will no doubt be of use to some people. It is an attempt by means of illustrations and diagrams with a condensed text on the subject to teach "the subject from a different angle."

The illustrations depict the anatomy and physiology of the organs of reproduction and the growth of the fœtus, the appearance of the pelvic organs during pregnancy and labour and the effect of the treatment of the patient and her child after birth. Lastly there are some skiagrams. The illustrations are excellent except Number 228. This picture must be regarded as an unpardonable error. Saline solution should never be injected into the breast tissue, for it will certainly cause sloughing of the breast, but into the cellular tissue beneath the breasts.

The ideal way to teach midwifery is by dissection and demonstration in the anatomy department and by guiding the student in the outdoor and indoor departments of a hospital, to acquire knowledge and technical skill in the subject proper. Before he enters the hospital this book might help to preface the way for the student and afterwards to refresh his memory.

¹ "Modern Methods in the Diagnosis and Treatment of Heart Disease," by Francis Heatherley, M.B., B.S. (London), F.R.C.S.; Second Edition; 1926. London: Baillière, Tindall and Cox. Post 8vo., pp. 282. Price: 8s. 6d. net.

¹ "An Atlas of Midwifery," by Comyns Berkeley, M.A., M.C., M.D., F.R.C.P., M.R.C.S., and Georges M. Dupuy, M.D.; 1926. London: Baillière, Tindall and Cox. Demy 8vo., pp. 160, with 248 figures in the text and X ray supplement. Price: 7s. 6d.

The Medical Journal of Australia

SATURDAY, JANUARY 1, 1927.

A Retrospect.

THE birth of a new year is for many people an occasion for relaxation and rejoicing. The old year is dead and is soon forgotten; hope and optimism dominate the minds of those who can consign the past to oblivion. Those who recognize the smallness of the human intellect and the narrow limits of human knowledge, stop from time to time to review the immediate past, to seek the causes of failure and the indications of progress and to gather from the collected records some guidance for fresh endeavours. The object of this yearly summary of the more important events and achievements is to assist in guiding the thoughts of serious students in directions that seem to promise well, and to warn others not to tread paths that have proved to be dead ends. To those who are striving to increase the sum of human knowledge and to leave a record of their contributions, a word of advice may not be out of place. Much good work is misunderstood and misinterpreted because of the want of care bestowed upon the choice of expressions and formation of sentences in the written messages. There is an old Latin saying: *Ad Cleanthis lucernam est erigilatum*, which reveals that from the earliest times it was expected of all earnest students to express their meaning exactly and with great pains.

The Medical Profession in Australia.

A month ago Dr. H. Douglas Stephens, speaking to the Victorian Branch of the British Medical Association before vacating the President's chair, stated that Victoria was sufficiently provided with doctors to satisfy all requirements for the next seven years. This estimate was apparently based on the average rate of increase of the population and the average rate of growth of the medical profession. It appears, however, that the number of entrants to the medical schools in Melbourne, Sydney and

Adelaide has diminished considerably during the past year. As far as can be ascertained the number of names added to the six medical registers of practitioners from overseas has remained approximately unchanged. The growth of the medical profession is still a little more rapid than the growth of the general population. The number of fifth year medical students who will complete their course in August, 1927, at the University of Sydney, is substantially less than that of the year 1926. The annual increment seems to have reached its peak a year or two ago and a slower rate of increase may be expected in the course of the next few years. There is, however, as yet no cause for alarm; the medical profession is large enough to cope with all the demands placed on it.

The British Medical Association.

During the year 1926 the Queensland Branch of the British Medical Association has become incorporated under the *Companies Act* of Queensland in accordance with the conditions set out in the amended Articles of Association and By-laws passed by the Representative Body in 1922.

The South Australian Branch has adopted rules for the formation of sections. Two sections have already been created and others are contemplated. One of the rules for sections is to the effect that the committee of the section must undertake to prepare records of scientific meetings to be forwarded to this journal for the purpose of publication. The Victorian Branch has manifested great activity in regard to the holding of meetings. During the course of the year no less than twenty-five meetings were held. The New South Wales Branch has maintained the usual standard; there were eighteen meetings. The Tasmanian Branch has continued to develop its work by means of its two divisions and has introduced a very useful expedient in the form of lectures delivered at the Launceston General Hospital to members of the Branch. Both in Hobart and in Launceston a valiant attempt has been made to assist the members both scientifically and from the point of view of medical politics. An innovation has been introduced by the New South Wales Branch; British Medical Association lectures have been inaugurated. These lectures are delivered

by leading practitioners in Sydney to the members of the affiliated associations in the several country districts throughout the State.

The Queensland Branch has recently inaugurated an annual lecture named the Bancroft Memorial Lecture. The first lecture was delivered on August 6, 1926, by Dr. J. McKelvey.

The medico-political activities of the Branches and of the Federal Committee of the British Medical Association in Australia have absorbed much time and energy. The matters that have engaged the attention of these bodies more particularly are the relationship of the medical profession to the public hospitals and the proposal to introduce uniformity throughout the Commonwealth in friendly society lodge practice.

Some important additions have been made to the measures adopted by the British Medical Association for the better attainment of its objects. In February the first issue of the *Archives of Diseases in Childhood* was produced. This new magazine is published every two months by the British Medical Association. It is destined to fill a need, to promote the study of diseases of children and to serve a useful purpose as an educational medium. The editors, Dr. H. Thursfield and Dr. R. Miller, are supported by other eminent physicians who have specialized in pædiatrics. Among them is Sir Dawson Williams, the editor of *The British Medical Journal*, who combines special knowledge of this branch of medicine with a vast experience as a medical journalist. Fuller details concerning the *Archives of Diseases in Childhood* will be published in a subsequent issue of this journal. Medical practitioners interested in children's diseases cannot afford to be without this admirable magazine. The Association has recently acquired the *Journal of Neurology and Psychopathology*. It is anticipated that the value of this periodical will be enhanced under its new ownership.

The British Medical Association is also utilizing other means for the advancement of medical science. During the year 1926 a new prize, the gift of Mrs. Bishop Harman, has been inaugurated. This prize will be offered every two years for the most valuable work having for its object the study of disorders

incidental to maternity. It will stimulate research in a very important subject and will be an indirect weapon to safeguard the health of mothers. Prizes are being offered to students of medicine both in the United Kingdom and also in the outlying parts of the Empire for essays on special subjects. The objects of these prizes is to stimulate original work and to foster the spirit of research. Each year prizes of £10 are offered for the best essays by final year students on a selected subject in fourteen separate groups. One group comprises medical schools in the British Empire outside the British Isles. The Association awards as heretofore the Middlemore Prize for original work in ophthalmology, the Stewart Prize for the advancement of knowledge of epidemic diseases and the Sir Charles Hastings Clinical Prize for the encouragement of observation and record in general practice. In the last place mention should be made of an important book that has been published by the British Medical Association on the periodicals of medicine and the allied sciences in British libraries. This work has been compiled by Professor R. T. Leiper, F.R.S.; it should prove invaluable to research students in England.

The Universities.

The medical curriculum at the three universities in Australia has not yet been recast. That this reform is considerably overdue is admitted by all thoughtful persons. An interesting report on this subject has been drawn up by Professor R. J. A. Berry and considered by a committee of the Faculty of Medicine of the University of Melbourne. Professor Berry has adopted many of the proposals included in the report published in this journal six and a half years ago. He enters in considerable detail into the programme of the student's term. It will be noted that, while he is a strong advocate of the proposal to spread the teaching of the fundamental sciences over the whole curriculum, he still favours the systematic lecture and is apparently not convinced of the necessity of special elementary training in science during the final stages of school life for boys and girls prior to entry into the medical schools. In all parts of the world the demand is becoming more and more insistent that the

general education of the medical practitioner of the future must be broader than that of the average doctor of today.

A few changes have been witnessed in the three schools. In Sydney Professor Sir John Macpherson has retired and Dr. W. S. Dawson has been appointed Professor of Psychiatry in his place. Dr. C. Witherington Stump has been appointed Associate Professor of Anatomy and is at the present time acting as full Professor during the temporary absence of Professor A. N. St. G. H. Burkitt. Advertisements have been published in the columns of this journal calling for applications for the position of Elder Professor of Anatomy. The applications close on the last day of March, 1927. The new incumbent of the chair will be required to enter upon his duties as soon as possible after the beginning of June. The present Elder Professor is Professor F. Wood Jones. He was appointed in 1920 and has raised the teaching of anatomy in Adelaide to a very high level. His position in the world of anthropology and his achievements as a morphologist and philosopher are too well known to need elaboration in this place. The University of Adelaide will be much the poorer when Professor Wood Jones vacates his chair.

In March the Senate of the University of Sydney announced that Dr. Gordon Craig had offered an annual sum of £300 to cover the cost of establishing a fellowship in urology. He has further provided a laboratory and is maintaining this laboratory at his own expense. It is estimated that the total amount of his gift to the University will eventually reach £20,000.

A research scholarship has recently been founded at the University of Sydney through the munificence of the late Osborne Henry Reddall. The sum of £3,000 has been bequeathed by him for this purpose.

Mention must be made of the generous benefaction of Mr. Sidney Myer who has recently presented to the University of Melbourne twenty-five thousand shares in the Myer Emporium Limited, to be expended in any manner that may be found desirable. The gift at present represents about £50,000 and is the largest single donation received up to the present by the University of Melbourne.

Post-Graduate Work.

The Melbourne Permanent Committee for Post-Graduate Work has continued to render valuable service to the medical profession throughout the year. In addition to the annual course held in November, special lectures were given throughout the winter months in Melbourne and in the country. The committee has been in existence for six years and has achieved unquestioned success. It is announced that some important lectures will be delivered in the winter of 1927 by an American surgeon and an American physician of high repute.

The post-graduate course held in Sydney in April proved itself to be the best that has yet been organized in New South Wales. The course was in obstetrics and the Royal Hospital for Women, the Women's Hospital, Surry Hills, and the Tressilian Mothercraft School, Petersham, were placed at the disposal of those taking part in the course. This course is the first that had been in the hands of the New South Wales Branch of the British Medical Association. Previously the arrangements were undertaken by the University Extension Board.

A valuable post-graduate course was organized by the Queensland Branch of the British Medical Association during the early part of the year. The course was held in August. There were no formal lectures. Demonstrations and clinical talks were given each day. The course was well attended and much appreciated by the practitioners in Queensland.

Obstetrical Research.

In May, 1925, the Trustees of the Edward Wilson (*Argus*) Fund offered to the University of Melbourne the sum of £10,000 for the purpose of endowing research in the science of obstetrics. The Council of the University referred the matter to the Faculty of Medicine and the Faculty appointed a strong committee with a nominee of the Edward Wilson (*Argus*) Fund to carry out the wishes of the Trustees. In September, 1925, the Council on the advice of the committee appointed Dr. R. Marshall Allan, M.C., the Director of Obstetrical Research. Dr. Marshall Allan has taken his duties very seriously and has carried out extensive investigations into the causes of maternal morbidity and mortality

and generally into the methods of obstetrical practice in the State of Victoria. Dr. Allan publishes a full abstract of his interim report in this issue. The interim report was presented to the committee on November 9, 1926. Many of the tables containing a mass of information have been reserved for the final report. The ground covered is considerable and the significance of the work is apparent to all. Although the appointment of Dr. Marshall Allan has been made by the Council of the University of Melbourne, it is necessary to emphasize that this work has been rendered possible by the munificence of a private trust. The waste of maternal and infant life and the impairment of the health of mothers and their babies have engaged the serious attention of hygienists in every civilized country. No better method could be devised to check this waste than that of a scientific investigation into the direct and indirect factors. By securing the services of a highly trained and experienced obstetrician, the Trustees of the Edward Wilson (*Argus*) Fund have revealed discrimination and foresight. It will be noted that the committee to which the matter was referred, comprises representatives of the Medical School, of the Women's Hospital and of the Walter and Eliza Hall Institute for Research in Pathology and Medicine, nominated by the Faculty of Medicine; a representative of the Victorian Branch of the British Medical Association; three representatives of the medical profession and one nominee of the Wilson Trust. The Government has contributed nothing and has had no voice in the administration of the funds or in the organization of the work. It appears that national and international services of the most important character are being left to the generosity and broad-mindedness of private individuals and private bodies. The responsibility for this kind of work belongs in fact to the State. The campaign against disease and avoidable death is a community matter. But experience has taught that when rich men and those in charge of their estates accept this public duty voluntarily, the work is carried out with less official interference to the immense advantage of the undertaking. The Government of Victoria has not displayed generosity to the University and the result

of this parsimony has been that even medical education is handicapped. Money should have been found long ago for chairs of medicine, surgery, preventive medicine and obstetrics. The Trustees of the Edward Wilson (*Argus*) Fund have rendered a service to the community which should be recognized to the full extent.

Preventive Medicine.

The valuable report of the Royal Commission on Health, which was published late in 1925, has been studied with diligence by the Branches of the British Medical Association in Australia and by the Federal Committee. The recommendations with but few relatively unimportant exceptions have been endorsed. The medical profession, however, has been reluctant in devising means for the carrying out of those proposals that concern the practising portion. There is evidence of considerable activity on the part of the Commonwealth Department of Health in the directions suggested by the Royal Commissioners. A conference of the responsible authorities of the several States in regard to the administration of the health laws with the Director-General of Health for the Commonwealth resulted in the general adoption of the recommendations. It is probable that a Federal health council will be created within a short time and that other recommendations of the Commissioners will also be put into effect. Closely associated with these questions is the convention by the Department of Health of a conference of representatives of the health services in the Pacific. It will be remembered that the Royal Commissioners favoured the establishment of schools of preventive medicine and tropical hygiene. These matters will receive attention in the near future in these columns.

Australasian Medical Congress (British Medical Association).

The second session of the Australasian Medical Congress (British Medical Association) will be opened on February 3, 1927, in Dunedin. The number of Australian practitioners who have enrolled as members of Congress up to the present, is disappointingly small. The Executive Committee has worked assiduously and skilfully and the provisional programmes published in these columns

during the past few months reveal that the work has been well done. The meeting should be very interesting and the deliberations of the members should lead to a material advance in knowledge in the many branches of medical science. Even at this late hour we commend the Congress to all members of the British Medical Association in Australia and state without fear of contradiction that the cost in time and money of attendance will be amply repaid by the advantages to be gained thereby. Apart from the scientific aspect of the meeting, there is the social side which has not been neglected by those in charge of the arrangements. Australian practitioners will receive a warm welcome from their colleagues in New Zealand and in Dunedin in particular.

The Australasian Medical Publishing Company, Limited.

The year 1926 has been one of great importance to the Australasian Medical Publishing Company, Limited. The Printing House was occupied early in 1925 and at the end of the year many of the initial difficulties of the undertaking had been overcome. Little by little progress was made. The staff of The Printing House carried out with admitted success the printing of many scientific works. The setting of scientific technical matter, the bugbear of the commercial printer, has offered no difficulty to those engaged in this work. At first contracts for the printing of scientific magazines and journals were sought and as the quality of the work of the staff was unknown, the tenders were not invariably accepted. Later as the reputation of the House became established, those responsible for scientific publications approached the company and the amount of work increased steadily. At the present time the staff can scarcely cope with the work. Moreover the prospects for 1927 are excellent. The Directors of the company have under consideration an increase in the size of the plant in order that the company may be able to fulfil its functions as the scientific press of Australia. Those who have supported the company in the past, realize that it is impossible to develop a new business in a few months. The early stages are costly and as progress is made, there is less way to be gained. The progress has been more rapid than is usual in this

class of business, for the period of working at a loss was but a little longer than one year.

During the course of the year THE MEDICAL JOURNAL OF AUSTRALIA has been enlarged to a not inconsiderable extent. Notwithstanding this increase in size the amount of material worthy of publication remains in excess of the available space. A further increase in size cannot be entertained at present on account of the expense of publication. It is hoped, however, that the readers of the journal find the matter of interest and derive benefit by its perusal. The development of the journal is governed to a large extent by the rate of growth of the medical profession. Although that growth is by no means slow, it is not fast enough to satisfy those responsible for the production of the journal. All means within their reach are used to increase the usefulness of the weekly issues and to enhance their value to the members of the several Branches of the British Medical Association in Australia.

The postponement of the publication of a popular medical magazine referred to in a recent issue of this journal and the delay in the publication of the medical directory are due in part to the fact that the plant of The Printing House is insufficient to complete all the work on hand as well as these new ventures. It is anticipated that this defect will soon be remedied.

The College of Surgeons of Australasia.

It is anticipated that the College of Surgeons of Australasia will be founded in Dunedin at the time of the second session of the Australasian Medical Congress (British Medical Association). Some preliminary work has been carried out and the founders have endeavoured to draft a constitution that will enable those who are called upon to control the organization, to fulfil its function, namely to raise the status of surgery in Australasia and to improve the practice of surgery. At the present time the prospective college is a voluntary body in the process of formation. After February of next year it will become a semi-official body and if it serves its purpose faithfully and well, it will later be recognized just as the Royal College of Surgeons of England is recognized throughout the whole of the English-speaking world.

Abstracts from Current Medical Literature.

SURGERY.

Some Fundamental Principles in the Pathology of Bone.

OSTEOGENESIS has been discussed for more than twenty years and is still unsettled. R. Leriche and A. Pollicard (*Surgery, Gynecology and Obstetrics*, September, 1926) as a result of their researches say that the formation of bone is the result of a metaplastic change in the connective fundamental substance. This metaplasia takes place in three stages: (i.) Transformation of the connective tissue by an oedematous infiltration with a multiplication of connective fibrils, (ii.) infiltration by a special substance chemically undefined—the preosseous substance, (iii.) deposits in that substance of a calcareous mixture. Osseous metaplasia can occur in all types of connective tissue and in it the cells do not play the part clinically attributed to them. The osteoblasts do not directly secrete osseous substance between the cells. The osseous transformation in the connective tissue is a phenomenon independent of all cellular action. The cells present in connective tissue hinder osseous metaplasia and connective tissue undergoes osseous transformation only where there are no cells. In the constructed bones the osseous cells have a minimum of vitality and they exist almost without metabolism. Osteoblasts are not bone forming cells, but rather hinder its formation. The periosteum has no true osteogenic function or action. In normal conditions it prevents the formation of bone. It checks osseous infiltration. The periosteum does not cover an osteogenic layer of numerous osteoblasts, but when the periosteum is modified by a change of circulation, it becomes a medium for ossification. Osseous metaplasia of connective tissue is a reversible process. Bone appears and disappears with the greatest facility. In rarefying diseases such as *osteitis fibrosa* there is always in the neighbourhood of the rarefied bone a more or less abundant formation of new bone. In bone transplants the formation of new bone depends on the absorption of the transplant. Bone absorption takes place in two ways, by osteolysis or osteoclasia. In osteolysis the osseous metaplastic transformation of the fundamental connective tissue simply disappears, a connective tissue matrix appears again. In an osteoclasia the action of the phagocytic giant cells, due to osteoclasts, occurs, but these cells are in no manner specific. In the absorption of bone the part played by osteoclasia is far less than that of osteolysis.

The Formation of Adhesions.

GEORGE LENTHAL CHEATLE (*The Lancet*, October 30, 1926) discusses the natural formation of acquired adhesions. Adhesions may form by one of two methods, the direct and the

indirect. The direct method is that concerned in the formation of adhesions between two apposed surfaces denuded of their epithelial covering and in contact with each other. These adhesions are formed by a healing process of first or of second intention. The author has studied the formation of adhesions by the indirect method in the *bursa patellae*. By this means he hoped to be able to explain the long thin adhesions so often found in serous cavities. He describes the process as commencing with acute inflammation due to traumatism. The endothelium becomes rubbed off in various parts and from these areas plasma is poured into the interior of the bursa. The plasma coagulates in the wounds and in the centre of the cavity. By means of the coagulation in the wounds an attachment is provided for the strands of fibrin and the fibrous tissue at the bases of the attachment grows upwards inside the endothelial extension, taking with it blood vessels for the nourishment of the new tissues. In this way the strand of fibrin becomes organized into a long adhesion. The fibrin eventually disappears. The formation of adhesions after infective inflammation is a more complicated process. In these circumstances the formation of adhesions begins with the advent of immunity when the products of microorganisms are no longer able to destroy tissues and prevent coagulation of plasma.

Extraperitoneal Closure of Artificial Anus.

T. CARWARDINE (*The British Journal of Surgery*, October, 1926) discusses Greig Smith's method of the extraperitoneal closure of the artificial anus. He holds that if the technique were better understood, the method would be more popular. Preliminary treatment is necessary and consists of division of the spur and restoration of a natural channel by mechanical means. The most suitable device for division of the spur is Dupuytren's enterotome. Precautions must be taken that the instrument after application is not pulled out by the patient and that it is not pushed into the abdomen. With the latter object in view a broad cork is fitted to the blades of the instrument. From five to seven days are required for the crushing of the spur. The restoration of the natural channel of the bowel is effected by the method described by Mitchell Banks. This consists in the introduction into the lumen of the bowel of a piece of rubber tubing of large dimensions. A button valve made of rubber may also be used to shut off faeces from the surface. Diagrammatic representations of both these implements are published in the article. By means of this preliminary treatment natural defaecation is sometimes restored and the artificial anus becomes very small. At the same time the author points out that this part of the treatment may be tedious. He holds that its adoption is justified by the lessened mortality associated with it. Extraperitoneal closure follows the preliminary treatment. It

may be divided into four operative stages. The first stage consists in the making of the incision. This takes the direction of the chief muscular fibres on each side of the opening and extends down to the subperitoneal tissue. As a rule some skin is included for this when inverted increases the lumen of the bowel at that point. The second stage consists in the separation of the bowel. The peritoneum with its areolar tissue is separated from the overlying muscles all round over a circle with a radius of five centimetres or more. The bowel with its adherent parietal peritoneum is then delivered through the incision. All superfluous pieces of tissue are removed and the gut is ready for the third stage—the stage of suture. In suture of the opening the edges must be inverted without tension. Continuous catgut stitches are used. A reinforcing continuous suture is used and further reinforcement is obtained by interrupted sutures. Emphasis is laid on the necessity for the securing of accurate apposition. The closure of the wound is the fourth stage. Through and through relaxation sutures are used and a small drainage tube is inserted into each end of the wound. No skin sutures are used. The author emphasizes the low mortality. It should in his opinion be well under 5%. In a series of thirty-eight cases recorded by him three deaths occurred. In each of these serious complications were present—previous gangrene of the bowel, cancer in the pelvis and previous operative peritonitis. Enterectomy by a two stage method—Paul's method—is admittedly the safest for the large bowel and the author holds that if to this an extraperitoneal method of closure is added, a lower mortality will be obtained than with any other procedure.

Radical Operation for Urethral Stricture.

R. HAMILTON RUSSELL (*The British Journal of Surgery*, October, 1926) describes a modification of the operation for the cure of urethral stricture originally devised by him. He points out that there are two attributes possessed by the male urethra which favour the treatment of a stricture by excision. In the first place the urethra has a capacity for spontaneous restoration after it has been slit up, no matter to what extent. In the second place the elasticity or extensibility of the urethra which is physiologically controlled, enables it to lengthen or shorten in response to changing conditions of the generative organs. The urethra when slit up is converted from a tube lined with mucous membrane into a "riband" covered with mucous membrane. Its restoration can be left entirely to natural processes and will depend on the obvious fact that a strip of mucous membrane flanked on either side by raw tissues which tend naturally to fall together and cohere, will, when this has taken place, be of necessity converted into a tube. The author's new operation differs from his old operation in two important particu-

lars. In the first place the membranous urethra is not sought for and opened in the first stage and often not opened at all. In the second place the channel through the strictured portion of the urethra is disregarded and not looked for. The bulb and adjacent portions of the *corpus spongiosum* and urethra are exposed. A metal bougie is passed down to the face of the stricture. A transverse cut is made across the urethra at the point of the bougie. The inflammatory mass containing the strictured area is dissected up from its bed. Eventually the urethra will be seen emerging from the urethral foramen in the triangular ligament. In order to remove the stricture and the inflammatory mass with a minimum length of urethra a series of sections about six millimetres in thickness are cut away from the distal end of the mass until the open mouth of the urethra appears. The remainder of the inflammatory tissue is clipped away. The proximal and distal portions of the urethra are slit up for a considerable distance, the urethra being converted into a "riband" instead of a tube. The ends of the "riband" are sutured together with sutures of chromicized catgut. A catheter is tied into the urethra for five days. In the operation an annular cicatrix is substituted for a stricture. This is not so unsatisfactory a procedure as it would appear. The annular cicatrix takes years to contract and may always be kept under control by dilatation with sounds. The author recommends that the urethra should be examined every twelve months for the first three years and that the findings should act as a guide for future dilatation.

Salivary Calculi.

GUY R. HARRISON (*Surgery, Gynecology and Obstetrics*, October, 1926) draws attention to calculi of the salivary glands and ducts. Their presence is infrequent, so far only 375 cases being recorded since 1825. They occur more frequently in males than in females and are apparently found as often in the young as in the aged. They are usually single except in the parotid gland where multiple stones have been reported. Symptomatically patients may be divided into three groups: (i.) Those in whom the stone acts as a ball valve and in whom the gland swells after eating, (ii.) those with a sudden pain and swelling in the gland and (iii.) those with a chronic swelling of the gland often accompanied by a surrounding cellulitis. X rays constitute the main diagnostic agent, but many stones may be felt in the ducts through the mucosa. Treatment is surgical and consists of removal of the stone. In the case of the sublingual gland or submaxillary gland they can usually be extracted by an intraoral incision. If situated in the parotid especially in the masseteric portion or in the posterior third of the submaxillary duct or submaxillary gland, an external incision is necessary. If stones are situated in the submaxillary or sublingual glands themselves extirpation of the gland is indicated.

Carcinoma of the Colon.

SAMUEL ROBINSON (*California and Western Medicine*, July, 1926) in a paper on carcinoma of the colon, not including the rectum, states that patients with sufficiently severe toxæmia from complete cancerous obstruction of the bowel will die in spite of any operation, however well chosen or well executed. Resection and anastomosis in a single operation done in the presence of obstruction is generally fatal. Even in partial obstruction, resection and anastomosis generally fail, unless the bowel has been cleared previously of its contents either by repeated irrigations when such are possible or by a preliminary colostomy or ileostomy. Rectal retention after anastomosis is "toxic"; distension may cause necrosis about the suture. Infection is the most common cause of death following resection of tumours of the colon. Anastomoses are apt to leak, causing general or local peritonitis if the suture is imperfect, if the blood supply to the anastomosing ends is a poor one or if it is cut off during the operation. In many patients leakage resulting from the pressure of distension proximal to the suture line causes deaths which might have been obviated by a post-operative ileostomy. Masses of inflammatory glands may be excluded from the portion resected, but malignant glands, if not removed, hasten the disease to an early termination. Resections, not designed to include most of the involved glands, rarely cure, hence the large number of fatalities within the first two years. Neglect of pre-operative preparation, a choice of operation inconsistent with the patient's condition, lack of provision to avoid postoperative distension, disregard of blood supply during anastomosis and poorly executed intestinal suturing are errors which lead to disaster.

Periarterial Sympathectomy.

R. W. MCNEALY (*Journal of the American Medical Association*, June 26, 1926) writes a paper on periarterial sympathectomy and comes to the conclusion that he is not prepared to accept either the theory or the practice of the present operation of periarterial sympathectomy. His experience as well as the reports from other workers would seem to suggest that the operation should be discarded. He states that a more careful study should be made of the sympathetic nervous system and also adds that an intensive study of the pathogenesis of various vascular disturbances should be made before operative procedures are adopted. The operation of periarterial sympathectomy carries with it some technical difficulties and is accompanied by not a few serious mishaps. The author further suggests that the substitution of ramisectomy and ganglionectomy for the present operation will greatly increase the operative risk, and in conclusion states that the present operation has had a stimulating influence in broadening the general knowledge in this field of

neurologic surgery and has served to weld a closer bond between the neurologist and the surgeon.

Meckel's Diverticulum.

R. M. HARBIN (*Surgery, Gynecology and Obstetrics*, October, 1926) reviews a series of thirteen cases of Meckel's diverticulum met with in a series of 2,624 abdominal operations. He includes another series of 507 abdominal operations in which particular search was made for Meckel's diverticulum, in these the condition was found on seven occasions. Thus the accepted figure that about 2% of human beings have this condition is borne out by the fact that about 1% of routine laparotomies disclose a diverticulum. The youngest patient was three, the oldest thirty-six, the average age being twenty-two years. In 70% of the cases the diverticulum seemed to be causing symptoms, but the preoperative diagnosis of diverticulitis was recorded only once. The author finds that the average distance from the ileo-caecal valve was about thirty-five to forty centimetres (fourteen to sixteen inches). As to the method of removal, this largely depends on whether the diverticulum is tubular, pedunculated or short. Some were resected and some unfolded. One caused acute obstruction. The author suggests that in all laparotomies a routine search should be made for a Meckel's diverticulum. Low resections that lessen the lumen of the gut, should be avoided as well as high amputation with redundant stump which may lead to subsequent adhesions. In discussing the after treatment the author refers to the probability of dysfunction. He advises that the treatment of resection should be that of peritonitis.

Prevention of Skin Excoriation from Intestinal Fistulae.

J. F. SMITH AND H. H. CHRISTENSEN (*Surgery, Gynecology and Obstetrics*, November, 1926) describe a method for the prevention of skin excoriation from intestinal fistulae. Fisher discovered that enzymes combine with certain substrates and only when this combination exists is the enzyme chemically active. Substances preventing this combination will therefore inhibit enzyme activity. Enzymes are readily taken up by finely divided substances such as inorganic precipitates, charcoal, kaolin and so forth. Hedin holds that this inhibition is brought about by a colloidal reaction, by absorption between the enzyme and the solid or colloidal phase. The degree of dilution does not affect the result. The authors have used with success a thin paste composed of powdered kaolin and glycerine. The paste is applied to the body surface surrounding the wound. Over this is spread a generous quantity of powdered kaolin to absorb the escaping fluids. This is covered with the usual dressings. Such applications will keep a patient comfortable for five or six hours. As the fistulae contract two applications in twenty-four hours have been sufficient.

University Intelligence.

THE UNIVERSITY OF MELBOURNE.

THE following is a report compiled by Professor R. J. A. Berry and submitted by him to a committee of the Faculty of Medicine appointed to consider the necessary emendations in the medical curriculum. According to the letter from Professor Berry published in these columns last week, the report has not yet been sent to the Council of the University of Melbourne for adoption.

THE MEDICAL CURRICULUM.

During the last few years much attention has been devoted in both Europe and America to the education of an efficient medical service for the prevention of disease and as the first step is necessarily the education of the medical man, it follows that the medical curriculum has been the subject of much close and expert study. This is reflected in the following reports:

(1) "Medical Education in the United States and Europe," 1910, (2) "Medical Education in Europe," 1912 (both published by the Carnegie Foundation for the Advancement of Teaching), (3) The Edinburgh Pathological Club's "Report on the Medical Curriculum," (4) "Recent Advances in Medical Education in England," by Sir George Newman, 1923, (5) "Medical Education," by Abraham Flexner, 1925, (6) Recommendations of the General Medical Council, London, for medical education, in operation as from January 1, 1923.

A study of any of these reports, particularly (4) and (6), makes it clear that medical education has ceased to be a matter of opinion and preconceived beliefs and has become a scientific business of order, progression and cooperative effort and administration and (6) makes it imperative for universities and medical schools to set their house in order, lest the recognition of their medical degrees and diplomas be imperilled.

It will be well, in the first place, to set forth some of the recent recommendations of the General Medical Council and to compare them with the actual practice in, say, such a medical school as that of the University of Melbourne.

Prior to the commencement of medical study the General Medical Council demands the fulfilment of four conditions: attainment of the age of seventeen years, the passing of an examination in general education, the passing of an examination in elementary physics and chemistry and registration as a medical student. The first and fourth of these conditions are not carried out locally. More stress is laid on two compulsory subjects, Latin and geometry than on a sound general education, whilst the third condition is fulfilled in the first year.

The General Medical Council stresses the facts that a medical curriculum is designed to educate the general practitioner, not the specialist, and that the importance of preventive medicine should be emphasized throughout the whole course. Hence what are known locally as "special subjects," are regarded as forming parts of medicine and surgery.

It is expressly stipulated that a minimum period of three years shall in every case be available for study after the completion by the student of the professional examinations in anatomy and physiology held at the close of the second year. It is only quite recently that an examination in these subjects has been held in Melbourne at the close of the second year and as yet a third year is devoted entirely to these subjects, it follows that the interval stipulated by the General Medical Council between the completion of the medical biological sciences and the final examination hardly exists in Melbourne.

The General Medical Council in its most recent recommendations says that the curriculum shall be so framed as to afford sufficient opportunities for the study during the last three years of the course of physics, chemistry, biology, anatomy and physiology in their practical applications to medicine, surgery and midwifery and that the student's knowledge of these complications should be subject to test in the final examination. Both these recom-

mendations are almost completely overlooked in several existing curricula.

Lastly, forensic medicine, a subject locally regarded as of minor importance and to be sandwiched in at any odd time as the exigencies of surgery, medicine and midwifery may permit, is regarded by the General Medical Council as the coping stone of the medical educational edifice, because in such a course, if properly compounded of forensic medicine, medical ethics and preventive medicine, the future practitioner learns his duties to the State, to his fellow practitioners and to his patient. It is not to be forgotten that there are probably more Acts of Parliament applying to the medical profession than almost any other and the student comes under some one or other of these Acts from the very first day of his medical studies.

Emphasis must, therefore, be laid on the facts that the General Medical Council has recently revised (a) the whole medical curriculum, (b) the dental course and (c) the training in public health. The revisions in the teaching of public health have, in fact, been so extensive that it has become almost impossible for a University like Melbourne, with its limited resources, to continue to grant a diploma in public health, because it can no longer comply with the conditions now prescribed. What has happened in public health may also occur in medicine. Hence the necessity of a revision of one's ideas as to what constitutes a medical curriculum.

As an evidence of modern opinion on the type of medical curriculum which the General Medical Council desires to see in operation, the following excerpts taken at random from one or other of the reports mentioned above, may be quoted.

"The pursuit of medicine requires a basis of general science."

"Biology is the foundation of medicine. If the medical man is not a biologist, he is nothing."

"The anatomist and the clinician must break new ground by conference, cooperation and joint teaching. At Leeds and other schools the Professor of Anatomy goes into the ward."

"Students should be taught in hospitals to regard disease as disordered physiology. The teaching of physiology is being continued in many British schools throughout the latter period of the curriculum and is synchronized with clinical instruction. In several schools physiologists have been attached to the hospital as *liaison* officers between the physiological department and the ward."

"The work of these laboratories has brought physiological life, stimulus and method into the hospital—the practice of therapeutics and the patient have gained substantially, but so also has physiology, for practical human problems have invigorated the physiological work. More far-reaching as an educational measure is the new plan of bringing the physiological student in his second year to the hospital, periodically, for the study of cases which illustrate physiological principles or methods."

"At present there is still too great a tendency to work in water-tight compartments . . . Much is lost by the practical divorce of physiological teaching from pathology and clinical medicine and surgery, partly owing to the student discarding his physiology when he has passed his intermediate examination."

"The clinician must be ever a physiologist, the physiologist always a researcher."

"Medicine is an indefinite portion of the vast field of biology, which is being gradually subjected to physical and chemical methods. Its several portions have really no distinct individuality; on the contrary, they merge into one another and are liable to regrouping."

"The medical school cannot expect to produce fully trained doctors; it can at most hope to equip students with a limited amount of knowledge, to train them in the method and spirit of scientific medicine and to launch them with a momentum that will make them active learners—observers, readers, thinkers and experimenters—for years to come."

"There is a logical or sensible method of approaching the task (i.e., medical education), inherent in the subject matter and in the objects to be attained, and fairly inde-

pendent of local conditions. Whatever variations may be due to traditions or national genius, assuredly medical science and medical practice are themselves sufficiently similar to suggest certain sound underlying principles of presentation."

"More important to the medical student than vaccination for variola is the enormous field now opened before him by the progress of our knowledge of immunity."

In pathology "there should be unity of conception and the necessary facilities—the classroom, the museum, the *post mortem* room, the experimental laboratory, the ward laboratory and the ward—all organized to one end."

"The purpose of the medical curriculum is the training not of specialists but of general medical practitioners. It is designed to produce a practical result."

"The doctor's first case is one, perhaps, of lumbago. The patient asks 'What is the matter with me?' 'How long shall I be ill and away from work?' 'Will you give me a certificate of incapacity?' 'How can I prevent these attacks of lumbago?' If the young doctor's educational medical curriculum has enabled him to describe and encouraged him to perform, say, a gastroenterostomy, rather than the answering of these everyday but most important questions, then it has failed in its objects and conception and has simply produced one more rank bad surgeon at the expense of a good practitioner."

"As clinical signs and symptoms are merely the evidence of disordered anatomy and physiology, i.e., of pathology, they must be interpreted in terms of their deviation from the normal."

"Biochemistry and biophysics, applied anatomy and physiology must now be placed in the forefront of clinical study and the General Medical Council has placed them there in the new curriculum."

As stated, the foregoing are excerpts from one or other of the reports mentioned. They could be multiplied almost indefinitely, but as they are quoted not to bolster up some particular opinion or fad of the writer, but merely to show the totally changed spirit which has come over the conception of medical education today, it is unnecessary to continue. The few quotations made will, however, probably serve to convince even the most sceptical that he who lives in the water-tight compartment of hospital, suburban practice, limited specialty or localized department, is living as regards medical education in a fool's paradise and is possibly not the best authority to devise schemes of medical education and as there are but few of us who do not fall into one or other of these categories, it is necessary to discard obsolete conceptions and start anew.

Bearing in mind these modern views of medical education it may now be permitted to submit proposals by which some, at least, of these newer ideas might be attained in our Australian medical schools. It is twenty-five years since the writer ventured to submit suggestions for the betterment of the then medical curriculum and that experience convinced him that the only way to consider the medical curriculum is to set it forth so that it can be visualized as a whole. Accordingly the accompanying table¹ shows the three terms of the year set forth in vertical columns, each term also divided vertically into days of the week. The five years and two terms (the latter a local device) are shown horizontally, as are also the hours of the day. It is thus possible to see at a glance exactly what happens at every hour of the day throughout the whole of the curriculum. Each term is numbered consecutively from the first to the seventeenth. The several examinations are shown on the right and as an examination is suggested at the end of every year it follows that such annual tests enable the student to build up his knowledge progressively and to proceed from the simple to the complex. Such annual examinations are, therefore, somewhat in the nature of progress reports. On the left are shown the several years of the course, named in accordance with the modern idea that medicine is a special branch of biological science. The first two years are spent entirely in the University. In all the remaining years the morning is devoted to hospital or clinical school and the afternoon to the university.

¹ Owing to lack of space it has not been possible to include this table in the present issue. It will be published next week.

The First Year or the Year of the Biological Sciences.

With the first year the General Medical Council has obviously found itself in some difficulty and has accordingly proffered several alternatives. (i.) The elements of physics and chemistry may be passed before registration as a medical student, in which case at least two university terms will be devoted within the university to the study of physics, chemistry and biology in their application to medicine. (ii.) The student may study within the university both the elementary and applied sides of the sciences in question. (iii.) The student may proceed to a science degree in the biological sciences and thus eliminate the first year of medicine altogether. He thus obtains two degrees, but takes a proportionately longer period of time before qualifying as a medical man.

In the accompanying scheme the second of these alternatives is adopted, not because it is necessarily thought to be best, but because it is the one most easily applicable to Australian conditions. The first term may, therefore, be applied to the elements of the biological sciences and the second and third to their special application to medicine. In the latter the syllabus should be carefully considered by the Faculty of Medicine, because if these subjects are to be taught by non-medical men, there is more than a risk that the application to medicine may be lost sight of in an enthusiasm for pure science, as occurs, for example, when the medical student is asked to devote the best part of a week to the structure of the atom, which is very far from being the conception of the General Medical Council, as the medical application of the biological sciences.

Without in any way dogmatizing on the subject of the first year of medicine it seems to the writer that the four conditions laid down by the General Medical Council as preliminary to the study of medicine at a university should be adopted. The first year of the biological sciences could then be largely devoted to the structure, functions and chemistry of the animal cell, with a simple introductory elementary anatomy and physiology course in the third term, putting, as it were, the coping stone on the year's work and preparing the student for the purely medical biological studies of the second year.

Whichever of these several methods of studying the first year of the biological sciences be adopted, there can be no doubt that a fairly high standard should in the interests of the student be demanded in the examination and at least two chances should be given him for the successful completion of the year. If a student be really quite unfit for the study of medicine, the sooner he finds it out the better. It is deplorable to see the "chronic" wasting years of his life attempting to pass examinations for which he has been denied the necessary gifts by Nature; making himself a nuisance to his teachers and only too often proving an evil example to his younger and abler fellow students. In addition to the moral evils there is also the economic factor, for the longer the student is allowed to dally over a pursuit for which he is clearly not fitted, the more unfit does he become for any other occupation. Hence the kindest thing to the student himself is the exaction of a fairly high standard in the first professional examination.

The Second Year or the Year of the Medical Biological Sciences.

The second year should be devoted entirely to the study of anatomy, histology, embryology and physiology in its several branches. The day should be divided into two halves, the one devoted to the structural sciences, the other to the functional. It should be remembered that the object is not the production of a professional anatomist or physiologist, but an efficient practitioner of medicine. Hence the bulk of the teaching work should be here undertaken, not by the professors of the subjects as at present, but by the younger members of the clinical staffs of the hospitals, under, of course, the supervision and direction of the senior member of the board of study of the subject, who will be the professor. The time of the professor or director of the board of study can be much more profitably employed directing research work and assisting in the teaching of senior students and graduates both in hospital and university. The present tendency to employ the most

skilled members of the university to teach junior students and to leave more advanced and difficult subjects to the care of the less skilled is a travesty of education and not even a secondary school adopts such obsolete methods. It is the experience of the writer that hospital surgeons make incomparably the best teachers of dissecting-room anatomy at this stage of the course and it ought to be possible to find an equally capable team of younger physicians to render the like service to physiology and themselves.

The examinations in both anatomy and physiology, annual and supplementary, should be straightforward, simple and honest in their attempt to ascertain if the student understands the principles of the sciences upon which the practice of medicine rests. As in the first year the standard should be high and for the like reason—the advantage of the student.

The Third Year or the Year of the Applied Medical Biological Sciences.

With the third year there commences in the present scheme the introduction of the principles upon which the General Medical Council now lays stress, that is that time should be given throughout the last three years of the course for the further study of anatomy, physiology, pathology and the like in their special application to medicine, surgery and midwifery. It is exactly at this point that it is not improbable that the writer and the reader may part company, for the application of the principles of the General Medical Council necessitates the introduction of ideas which may seem especially to the ultraconservative or the specially selfish entirely revolutionary, though as a matter of fact they are nothing of the sort.

Commencing with the seventh term after the student has studied the biological sciences in the first year and has further studied the medical biological sciences (anatomy and physiology) in the second year, he should now proceed to see something of their application to the living human subject, but only under adequate supervision. The scheme, therefore, shows attendance at hospital in the morning with a return to anatomy and physiology in the afternoon.

By attendance at hospital is not meant that the student wanders vaguely about hospital wards morbidly regarding patients of whose diseases and human peculiarities he knows nothing, but a carefully prepared scheme of instruction under the closest supervision. From 9.0 a.m. to 9.45 a.m. he should commence by attending in hospital a special class of instruction in physical signs—heart, lungs and the like. These should be explained and taught by a junior, but competent member of the hospital staff, who should also be a member of the board of studies of medicine, with the assistance, if and where necessary, of members of the boards of study of anatomy and physiology and this teaching could with advantage be occasionally participated in by the professors of anatomy and physiology or other senior members of their boards. The important points are that the class should be held perfectly regularly and daily and in accordance with a carefully considered syllabus, such as the one devised by the Scottish Branch of the General Medical Council and given on page 70 of Sir George Newman's report. The twenty minutes' interval between the termination of this class and the commencement of hospital work is a device specially introduced for the benefit of those university schools of medicine which are in the fortunate position of having more than one clinical hospital at their disposal and allows of the transport of the student from one hospital to another.

Proceeding to the wards (indoor medicine) the student should be taught, under the supervision of either senior students or junior house physicians the principles of case taking and at 11.0 a.m. should pass into the hands of the honorary physician or his assistant who simultaneously pays his ward visit and instructs his class.

It is exactly at this point that so many otherwise admirably arranged medical curricula break down. There may be two possible difficulties. One, the staffs of hospitals are selected for special reasons which usually take into account clinical, rather than teaching ability. Incidentally,

it may be pointed out that if the clinician is devoid of teaching ability, it is just as much the fault of the school in which he graduated as his own, for all modern medical curricula should somewhere furnish senior students with opportunities of acquiring educational methods by acting as student demonstrators. Two, in those clinical schools where the honorary staff do not attend daily, the difficulties of grafting modern teaching methods on to the medical curriculum are very great and it is hereabouts that many hospital teaching methods require reconstruction. It is impossible for the curriculum now demanded by the General Medical Council to be carried into effect with obsolete hospital methods. On the other hand a reconstruction in and increase of existing hospital staffs would be to the advantage of everybody concerned with both hospital and school. Attention will be directed to this point later under the heading "Boards of Studies."

In the afternoon of the seventh term the student continues at his university the study of anatomy and physiology and as he has now commenced his hospital studies he naturally dissects the thorax and abdomen and studies the physiology of respiration and circulation, thus effecting the closest correlation with his special medical work in hospital.

In the eighth term the student passes to the study of elementary surgery in the hospital in the morning and correlates this in the afternoon with his anatomy and physiology. A special course of lectures on the surgery of the limbs, dislocations, fractures, minor surgery and the like is linked up anatomically with the dissection or study of the limbs. His physiological studies are similarly continued.

In the ninth term as he has now had a general survey of the problems which will confront the general practitioner in the realms of medicine and surgery, he returns to indoor medicine at the hospital, and in the afternoon commences an elementary study of pathology and bacteriology and a course of physiology, pharmacology and pharmacological chemistry. Both these are preparatory to what is to follow in the three terms of the fourth year. At the close of the ninth term the student is expected to pass an advanced examination in physiology and the parts of anatomy specially studied, together with an elementary examination in medicine and surgery including elementary pathology and bacteriology. In this, his more advanced year in the medical biological sciences, the student should receive the assistance of the more senior members of the respective boards of studies and as regards his anatomy he should have the option of dissecting for himself, acting as demonstrator to junior students or of combining both, always, of course, under the supervision of the more senior members of the anatomy board of study. It is a tradition in some schools that anatomy can only be learned by a long succession of dissections, usually performed very badly and very wasteful of the student's time. With a course of dissections behind him, an anatomical examination successfully passed and some limited hospital experience, the student would confer more benefit on himself and possibly on others by acting as demonstrator to second year students. The surest way of mastering a subject is to endeavour to teach it to others, but in any case personally I should here give every student the option of choosing whichever course best suited him. As it is to be presumed that the weaker brethren have now been successfully dropped, the standard of the third year examination might be somewhat reduced as compared with the first and second year examinations. In any case the student should have his two chances.

The Fourth Year or the Year of the Abnormal Medical Biological Sciences.

The principle subjects of this year are naturally pathology and bacteriology, the keystones of the medical educational edifice. At this stage theoretical lectures on surgery and medicine can be given with advantage, as the student has had sufficient preliminary education to enable him to appreciate what the General Medical Council aptly terms the "principles and practice of surgery," hence these should now be expounded to him. With the clinical groundwork acquired in the third year he is now enabled

to pass with profit to something of the conditions of general practice and the out-patient department of a great hospital furnishes him with the opportunity, hence the whole of the three terms are here devoted to hospital out-patient practice which has the further advantage that it permits the student to attend with regularity and profit *post mortem* practice. In the morning the senior members of the respective boards of studies can apply clinically some of the great principles of physiology and pathology and some of the specialities, immunology, anaesthetics, venereal diseases and the like here find an appropriate place. In the twelfth term the student returns to his anatomical studies and prepares the way for future more intensive work in neurology, psychology and psychiatry. The year closes with a complete examination in pathology and bacteriology with more general papers in surgery and surgical anatomy and medicine, therapeutics and clinical physiology.

The Fifth Year or the Year of Applied Normal and Abnormal Biological Science.

Just as the fourth year is chiefly concerned with pathology and bacteriology, so is the fifth year mainly concerned with those most important branches of general practice, midwifery, child welfare and antenatal physiology and pathology. As before, the morning is concerned with general hospital practice and the afternoons are entirely or almost entirely absorbed by the study of midwifery and its allied branches. The advanced studies of the twelfth term on the head and neck and central nervous system are now followed by a two term course of neurology, a third term of clinical neurology, to be completed in the last two terms of the curriculum by a clinical study of psychiatry. In the thirteenth and fourteenth terms is introduced a special applied course on the anatomy of the pelvis and in the fifteenth term is similarly introduced a preparatory course on the anatomy, physiology and pathology of the special senses. The afternoon of the fifteenth term is largely freed from lectures, with the dual object of giving the student as much time as possible to attend his practical midwifery and of preparing for his written examinations in medicine, surgery and obstetrics. In any case the few lectures introduced in the fifteenth term might occasionally be missed if attendance at practical obstetrics justified it, because the specialist in the special senses should not attempt such practice without further and special education after graduation.

At the end of the fifteenth term (fifth year) there is introduced a somewhat novel feature, but one which has long been advocated by eminent medical educators in all branches; that is the complete separation of the theoretical final work from the clinical. It is here suggested that the student should sit for paper writing only in medicine, surgery and obstetrics with or without "orals" as may be determined (the General Medical Council says with), but certainly without any clinical examination. As the student has been gradually introduced to these most fundamental branches of general practice by being compelled to sit for elementary progress examinations in medicine and surgery in the third and fourth years, he must surely be a particularly dense individual if he experiences difficulty in passing such a theoretical examination, especially as he is to be given two chances. The great advantage of thus dividing the final professional examination into two parts, theoretical at the end of the fifteenth term and purely clinical at the end of the seventeenth, is that the last two terms of the course are thus set entirely free for the great preparation of the student's life work, that is the clinical application to the patient of everything he has learned in the long course to which he has voluntarily apprenticed himself.

The Two Terms of the Sixth Year or the Year of the Special Biological Sciences.

It is to be remembered that the two additional terms of the sixth year are largely a Melbourne innovation and are found in but few other courses. With properly organized teaching and clinical effort throughout the previous five years they should not be necessary, but as they are provided in Melbourne it is the duty of those who have im-

posed them, to utilize them to the best advantage and to consider the student in every possible way.

The General Medical Council demands seven terms of general hospital work. In the curriculum herein suggested nine such terms are allotted, therefore the general hospital clinician has no right to demand any further attendance from the student; hence these two terms are set aside for special hospitals and are as free as possible from all set lectures. Should, however, the student desire to brush up his general hospital clinical work, time is afforded him for the purpose. During these two terms the student should rather be regarded as a general practitioner in embryo and as he will necessarily have much travelling to his special hospitals which in most cities are scattered entities, it is important to consider his needs in these directions. Being a general practitioner in embryo he should certainly here be taught his future duties and obligations to the State, the patient and his brother practitioners and hence the introduction of the only lectures of the term, namely a course of forensic medicine, medical ethics and preventive medicine. At this stage, too, he might with advantage be admitted as a junior or probationary member of the British Medical Association with the privilege of attending its scientific meetings.¹ At the end of the seventeenth term the student presents himself for the final test of his long preparation, namely the clinical part of the final examination. Is he or is he not now fit to take charge of a patient? Can he give that patient an efficient medical service which will entitle him to his remuneration? If so, he is entitled to pass, to receive his degree from the university and to remain a permanent member of his chosen medical school as a life long and always welcome post-graduate student. Should he fail to satisfy the examiners, he ought to be allowed two further chances within the following six or nine months. Failure in either part of the final examination of this curriculum should be negligible and for two reasons: one, the weaker members should have been weeded out and two, the student is introduced gradually into the intricacies of surgery and medicine. Those who succeed in reaching the final examination under this scheme, should unquestionably qualify in less average time than under the older type of curriculum, though but few students pass through the whole medical course in the minimum time specified.

Boards of Studies.

By "boards of studies" are here meant something very comparable to the university clinics recently introduced into all the clinical schools of the University of London, as well as into the Universities of Edinburgh and Cardiff. They are fully described in Appendix C of Sir George Newman's report under the headings of staff, number of beds controlled, out-patient department, equipment, *post mortem* work, methods of teaching, coordination and research.

The present proposals contemplate the formation of such boards of studies not only for surgery and medicine, but for all the major subjects of the curriculum. The anatomy board would consist, for example, of the professor of the subject as chairman, the full time university assistants of the department, one surgical representative from each one of the three clinical schools in Melbourne, one medical representative from each hospital and similar representation for other subjects, such as midwifery. This board would arrange the anatomical instruction to be given throughout the whole course, whether in the anatomy department or in hospital, determine the teachers to take charge of the several courses, cooperate with the surgery, medicine and midwifery boards, prosecute research either in the anatomy department or in hospital and systematize and coordinate anatomical instruction for undergraduates and graduates in both the university and the three clinical hospitals. Hospital instruction in applied anatomy would thus be shared by every member of the board and there would thus be put into practical operation the dictum that

¹ The constitution of the British Medical Association does not admit of this. It is, however, possible to grant facilities to students to attend meetings of Branches without the privileges of membership. The New South Wales Branch extends this permission to students who are enrolled as associates.—EDITOR.

"the anatomist and the clinician must break new ground by conference, cooperation and joint teaching."

The formation of such boards of studies or university clinics would, liberally interpreted, articulate a disorganized and non-cooperative conglomeration of hospitals, laboratories and university into a great university school of medical education and research for graduates and undergraduates. It is hardly an exaggeration to say that at present the State of Victoria does not possess a medical school and the sooner it does, the better will it be for the community and certainly for the profession. Perhaps the writer is claiming too much for these boards of studies, but it would certainly seem that were the three Melbourne clinical hospitals to cooperate as partners with the university in a well thought out scheme of medical education on modern lines, instead of merely reduplicating each other's work, the conception of a great Victorian school of medical education and research would be appreciably nearer.

Were these university clinical units in existence under the scheme here proposed they would furnish the several teachers for the important 9.0 a.m. classes to be given in the hospitals. As it would be difficult and certainly very wasteful to try and triplicate these morning classes, it would surely serve the purpose better and would certainly foster the spirit of cooperation to give them in one hospital only, say, the third year series in hospital A, the fourth year series in hospital B and the fifth year series in hospital C. The twenty minutes' interval would enable the student to proceed from the hospital of instruction to his own selected general hospital and the amount of his travelling would be reduced by one-third. From the hospital standpoint it would mean that university professors, assistants and demonstrators would become integral teaching members of the staffs of all hospitals and by constantly meeting the staffs thereof would materially benefit themselves and possibly also the hospital staffs. In this way would be encouraged a spirit of loyalty to the medical school as a whole, rather than the narrower sectional or hospital view.

Assuming that the reader is as convinced as is the writer of the wisdom of the formation of boards of studies or university clinical units comprising all hospitals as well as the university, though possibly the assumption is erroneous, what are the difficulties in the way of realization? These are not those which so readily leap to the lips of the critic. They are deeper seated and more serious. There is, one, the grave understaffing of the university departments themselves, and two, a somewhat obsolete method of hospital staffing. As regards the first of these difficulties it is a reflection on any university to find medical departments of the first order and importance with one or at most two full time officers and this is, unhappily, only too true of almost every medical department in the University of Melbourne. The objective is one professor-director, two associate professors, two full time assistants and a team of part time demonstrators, drawn preferably from the clinical staffs of the hospitals.

The second difficulty is one rather of reorganization than of understaffing, though the perfect scheme might require some additional hospital appointments. In all great modern clinical hospitals the objective is the formation of clinical units consisting of in surgery, for example, a senior honorary surgeon in charge of wards, an assistant honorary surgeon who takes the place of his chief when required, but otherwise is always in attendance with his chief, an associated out-patient surgeon, with resident house surgeons, surgical clinical assistants, and student dressers and clerks, the whole forming a surgical hospital unit; the modern hospital may have six or more such units depending on the number of beds. The members of these units attend hospital every day for a limited period and are thus enabled to divide up the work between them and to relieve the senior member of the unit of much of the purely routine work. He is thus free for clinical instruction and is enabled to carry that out systematically daily and with advantage to himself, his students and his patients. Actually it is found that such units, when properly organized, take up less of the consultant's time than more limited attendance with longer hours, for every-

thing is arranged systematically, with duties allotted to all the several members of the unit.

A multiplicity of hospitals and clinical schools is, unless welded into a whole, a source of weakness rather than of strength. On the other hand, a university like Melbourne, with its numerous clinicians and its wealth of clinical material could with cooperation establish a really great Victorian medical school of education and research and no one can study the recent reports on medical education generally without coming to the inevitable conclusion that the time to begin is now.

Advantages of the Suggested Curriculum.

Whatever objections may be raised by *non possumus* or destructive critics against this suggested curriculum, there can be no question that it possesses certain advantages which seem to the writer to be as follows:

1. It fulfils the requirements of the General Medical Council, inasmuch as (a) it makes adequate arrangements for the effective correlation of the several subjects of study throughout the curriculum, (b) it makes available a minimum period of three years for study after the completion by the student of the professional examinations in anatomy and physiology held at the close of the second year, (c) it affords sufficient opportunities for the study during the last three years of the course of physics, chemistry, anatomy and physiology, in their practical applications to medicine, surgery and midwifery and allows of the student's knowledge of these applications being tested in the final examination, (d) it provides practical instruction in clinical methods and in the recognition and interpretation of physical signs at the earliest possible moment and (e) it gives instruction in the proper place on the duties which devolve upon practitioners in their relation to the State and on the generally recognized rules of medical ethics.

2. It considers the requirements of the student inasmuch as (a) it systematically proceeds from the simple to the complex, (b) the subjects of study are throughout arranged in logical sequence, (c) the necessary examinations are arranged in order of progress tests and the final examinations are gradually introduced with an increased number of opportunities for reexamination, (d) the time of the student is conserved and he never loses touch with his university or hospital, (e) no classes are held on Wednesday afternoon or Saturday morning, thus affording time for recreation, (f) it insists throughout that a medical curriculum is intended for the education of an efficient general practitioner.

3. From the standpoint of the teacher the suggested curriculum (a) safeguards his time by apportioning the more junior teaching to appropriate officers, thereby enabling the senior members to devote themselves more largely to senior teaching, research and post-graduate education—by far the most important work of a medical school; (b) it enables all senior teachers to cooperate in the clinical work of the school; (c) it links together in the manner advocated by the General Medical Council the academic with the clinical staff.

4. It makes possible the establishment of a Victorian school of medical education and research for graduates and undergraduates and would thus make medicine a living asset to the State.

Correspondence.

WANTED: TICKS.

SIR: I am taking the liberty to appeal through your paper for some ticks (*Ixodes holocyclus*). The present time is the season when the dog tick does her damage. Having spent a considerable amount of time studying the action of the poisons of the tick, there are still some points in her anatomy that I wish to clear up. If any of your readers could supply me with some dead ticks I shall be able to finish this portion of the work at once. There still remains a point about the paralysis produced in the hindquarters of the dog. I am still unable to say whether this is due to the poison affecting the peripheral nerves

or whether it is due to the cord being affected—probably the latter. If any live ticks could be obtained, Dr. Royle has promised to investigate this point for me.

The method of obtaining live ticks adopted by the late Dr. Sydney Dodd was to let his own pet dog run in the "bush," which was known to contain ticks. Immediately on his emergence he was carefully searched for the parasites. In this way during 1919 about thirty adult ticks were obtained. The females—for it is the female that does the damage—were placed in receptacles and in from fourteen to twenty-four hours were attached to various animals. Although ticks are very hardy little creatures, yet they are frequently found to be dead or moribund some hours after being collected by the above plan. If, however, anyone should get a live bandicoot, there will generally be found live ticks on the animal, as it appears to be the natural host for *Ixodes holocyclus*.

If anyone has a dog that is affected by tick paralysis, I shall be glad if they will telephone to me and I will either go and visit the dog—I want still to make some observations on the heart's action when the dog is fully paralysed—or will tell them how to treat it. I might mention that the keynote in the successful treatment is to remember that a dog must not be given any food or drink by the mouth.

Yours, etc.,

STEWART MCKAY.

227, Macquarie Street, Sydney,
(Undated).

FRACTURE OF THE CLAVICLE.

SIR: Couteaud was the originator of the method so ably advocated by Dr. Forbes Mackenzie.¹ His article appeared in the *Bulletin de l'Académie de Médecin* (Paris) in 1914 and was summarized in the *Critic and Guide* (New York) of December, 1914. As the method differs somewhat it will bear quoting. In my limited experience it has been quite satisfactory; but with Dr. Forbes Mackenzie the trouble has been to get the average patient to stay in bed. Children if nursed at first readily adopt the position since they find that any other causes pain. It should be insisted on for females.

Couteaud has abandoned all apparatus for he observed better results in cases which had not been treated than those which had. He orders rest in bed, with the arm in two successive positions, which produce continuous extension of the fragments. The first is the position in which the arm naturally hangs out of bed, the shoulder being out of the perpendicular. He first recommended that this position be maintained for some days, but he has now reduced the time to an hour and a half. In the second position the forearm is flexed to a right angle and rests on a stool below the level of the bed. The period has been reduced from two weeks to eight or ten days. This method is much simpler and more practical than the original which became popular in France. Coaptation is perfect . . . On the third day it may not be possible to find the seat of fracture. The callus is never exuberant and the form of the bone is preserved. . . . When the treatment is adopted—even after two weeks—good results are obtained. Couteaud forbids massage which may injure the callus until after union.

Yours, etc.,

JAS F. MERRILLEES.

St. Mary's, Roma, Queensland,
November 25, 1926.

Naval and Military.

LECTURES FOR OFFICERS OF THE AUSTRALIAN ARMY MEDICAL CORPS.

A COURSE of lectures for officers of the Australian Army Medical Corps will be held at the office of the Deputy

¹Dr. Merrillees refers to Dr. J. Forbes Mackenzie's article: "A Simple Method of Treating Fractured Clavicle," published in this journal on October 9, 1926.

Director of Medical Services, No. 3 Military District, Victoria Barracks, St. Kilda Road, Melbourne, from January 11 to February 4, 1927. The lectures will be delivered each Tuesday and Friday during this period at 8.30 p.m. All officers of the Australian Army Medical Corps Reserve are cordially invited.

The following is the programme of lectures:

Tuesday, January 11, 1927.

"Mobilization Plans, Present Constitution of Medical Services for War," by Colonel R. M. Downes, C.M.G., V.D., Deputy Director of Medical Services.

Friday, January 14, 1927.

"Duties of Regimental Medical Officers in the Field. Functions of Field Ambulances," by Lieutenant-Colonel D. D. Cade, D.S.O.

Tuesday, January 18, 1927.

"Elementary Map Reading," by Major W. T. Tackaberry.

Friday, January 21, 1927.

"What a Medical Officer Must Know of the Constitution of an Army and How it Fights," by Colonel W. J. Foster, C.B., C.M.G., D.S.O.

Tuesday, January 25, 1927.

"Gas Warfare: Methods, Protection and Treatment," by Squadron Leader A. P. Lawrence, M.C.

Friday, January 28, 1927.

"The Influence of Disease on Campaigns; Hygiene in the Field," by Major C. H. Kellaway, M.C.

Tuesday, February 1, 1927.

"Present Organization of Equipment—Medical, Australian Army Service Corps and Ordnance," by Major J. A. Heath.

Friday, February 4, 1927.

"War Medicine and Surgery," by Major H. H. D. Turnbull and Lieutenant-Colonel W. G. D. Upjohn, O.B.E.

Proceedings of the Australian Medical Boards.

VICTORIA.

THE undermentioned have been registered under the provisions of Part I. of the *Medical Act* 1915, as duly qualified medical practitioners:

Currell, James Alexander, M.B., Ch.B., 1906 (Univ. Edinburgh), 34, Pentland Parade, Yarraville.
Edgar, Arthur Hall, L.R.C.P. et S., (Univ. Edinburgh), L.R.F.P.S. (Univ. Glasgow), 1926, c.o. Mrs. Sturrock, Towers Road, Toorak.
Seed, Thomas Blake, M.B., B.S., 1925 (Univ. Melbourne), 31, Outram Street, West Perth, Western Australia.

Additional Qualification Registered.

Harold David Bowyer Miller, Dip.T.M. et H. (England), 1926.

QUEENSLAND.

THE undermentioned have been registered under the provisions of *The Medical Act* of 1925, as duly qualified medical practitioners:

Dawson, Frank Edwin, M.B., 1917 (Univ. Sydney), Kilcoy.
Merlino, Giovanni, M.D., 1924 (Univ. Messina), Innisfail.
Traill, John Eric, M.B., Ch.M., 1924 (Univ. Sydney), Atherton.

Wharton, Joyce Helen Wentworth, M.B., Ch.M., 1926 (Univ. Sydney), Monto.

NEW SOUTH WALES.

THE undermentioned have been registered under the provisions of the *Medical Act, 1912 and 1915*, as duly qualified medical practitioners:

Harris, George Thomas Hamlyn, M.B., 1926 (Univ. Sydney), Wermatory Station, Tumut.
Herrington, Alexander Clement, M.B., B.S., 1925 (Univ. Melbourne), c.o. Dr. D. T. Harbison, Bowral.
Vance, Ernest Sydney George Killen, M.B., B.Ch., 1918 (Q.U. Belfast), Mathoura.

For Additional Registration.

Dunstan, Chester Kingsley, M.R.C.P. (London), 1926.

Books Received.

MEDICAL CASE-TAKING: A GUIDE FOR CLINICAL CLERKS, by Alex. Mills Kennedy, M.D. (Glasgow); 1926. London: Edward Arnold and Company. Crown 8vo., pp. 148. Price: 5s. net.
HEWAT'S EXAMINATION OF THE URINE AND OTHER CLINICAL SIDE-ROOM METHODS, Revised and Enlarged by G. L. Malcolm-Smith, M.B., Ch.B., F.R.C.P. (Edinburgh); Seventh Edition; 1926. Edinburgh: E. and S. Livingstone. Imp. 32mo., pp. 236. Price: 3s. net.
CATECHISM SERIES: OPERATIVE SURGERY, by C. R. Whittaker, F.R.C.S. (Edinburgh), F.R.S.E.; Fourth Edition, Parts I, II, and III. 1926. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 216. Price: 1s. 6d. net each.
DISEASES OF THE SKIN, by James H. Sequeira, M.D. (London), F.R.C.S. (England); Fourth Edition; 1927. London: J. and A. Churchill. Royal 8vo., pp. 656, with illustrations. Price £2 2s. net.

Medical Appointments.

Dr. Victor S. Stone (B.M.A.) has been appointed Medical Superintendent of the Ballarat District Hospital, Victoria.

Dr. Kenneth B. Hope (B.M.A.) has been appointed Junior Resident Medical Officer, Ballarat District Hospital, Victoria.

Dr. Ralph Weaver (B.M.A.) has been appointed Honorary Assistant Ear, Nose and Throat Surgeon to the Mater Misericordiae Public Hospital, Brisbane.

Dr. Cecil Gordon Allen (B.M.A.) has been appointed Government Medical Officer at Canowindra, New South Wales.

Dr. L. H. Stanton-Cook (B.M.A.) has been appointed Honorary Relieving Assistant Ophthalmic Surgeon to the Royal Alexandra Hospital for Children, Sydney.

Dr. A. MacInnes (B.M.A.) has been appointed Honorary Visiting Medical Officer to the Royal Alexandra Hospital for Children Convalescent Home, Collaroy Beach, New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xxii.

ADELAIDE CHILDREN'S HOSPITAL: Medical Superintendent.
CUNEDIN LOCAL BOARD OF HEALTH: Resident Medical Officer.

MELBOURNE HOSPITAL: Medical Vacancies and Medical Superintendent.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marriickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association. Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Contract Practice Appointments at Ceduna, Penong, Murat Bay and other West Coast of South Australia Districts.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia. Yarloop Hospital Fund.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

JAN. 6.—South Australian Branch, B.M.A.: Council.
JAN. 11.—New South Wales Branch, B.M.A.: Council (Quarterly).
JAN. 13.—Victorian Branch, B.M.A.: Council.
JAN. 14.—Queensland Branch, B.M.A.: Council.
JAN. 17.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JAN. 18.—New South Wales Branch, B.M.A.: Ethics Committee.
JAN. 18.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JAN. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JAN. 26.—Victorian Branch, B.M.A.: Council.
JAN. 28.—Queensland Branch, B.M.A.: Council.
FEB. 8.—New South Wales Branch, B.M.A.: Ethics Committee.
FEB. 15.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

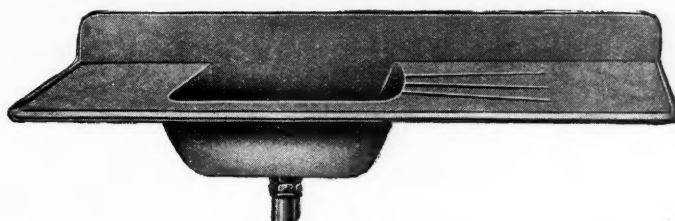
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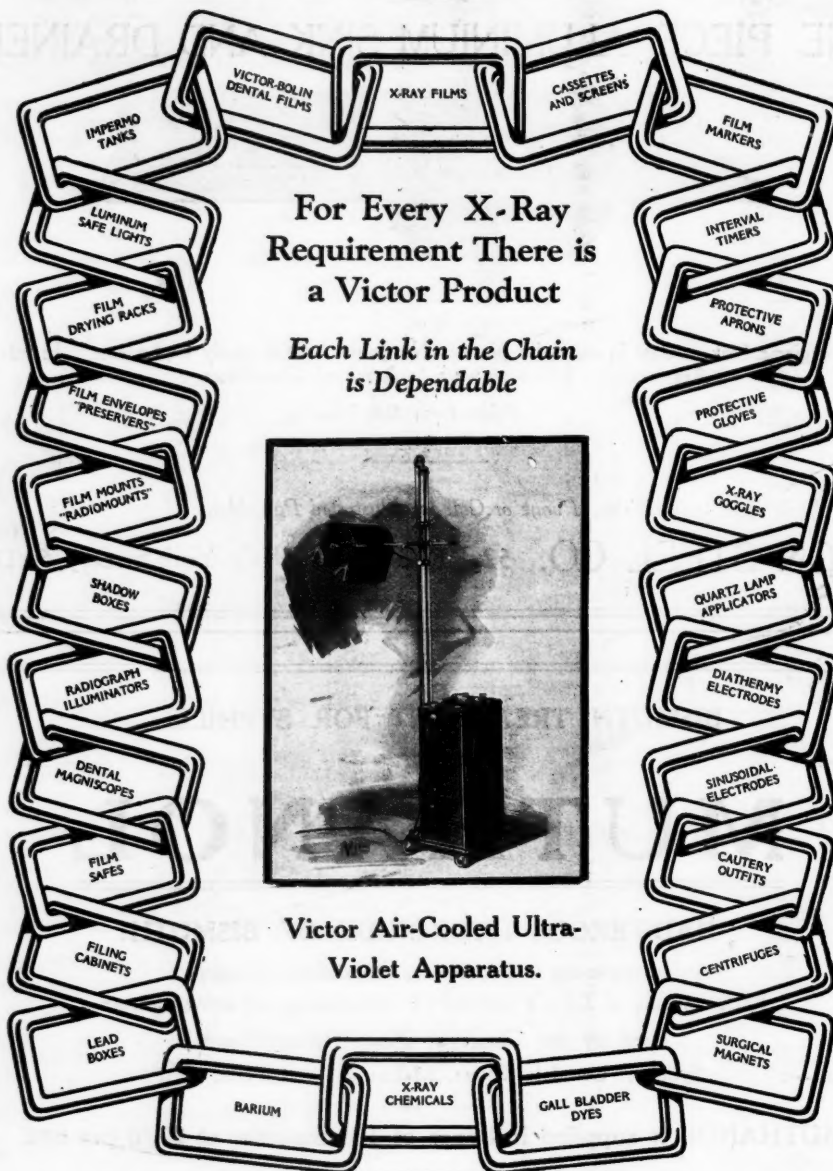
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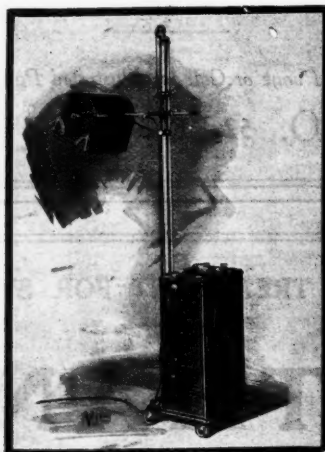
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